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Canadian Pulp and Paper Association Meets

Annual Convention Is Held at Montreal With 500 Delegates in Attendance — Program Stresses Importance of Conservation Methods—Achievements of the Industry in War Effort Outlined.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., January 30, 1943—The annual three-day convention of the Canadian Pulp and Paper Association, which was brought to a conclusion here yesterday, was attended by about 500 delegates, and was again a striking demonstration of the spirit of mutual helpfulness which pervades the industry and which the association has been a prime factor in building up. Every industry in the country and all business men are deeply immersed in problems having to do with the prosecution of the war effort that the executive of the Association felt the expense and the time involved in holding the convention could only be justified by making conservation in methods and use of materials the main theme of the discussions. The whole program, therefore, was planned to that end, and the general view was that the helpfulness of the papers presented, the exchange of information, and the discussions in which most of the leading experts in the industry took part, abundantly justified the convention.

E. Howard Smith Re-elected President

E. Howard Smith, who had occupied the presidency of the Association since R. L. Weldon was named Newsprint Administrator for the government some four months ago, was re-elected president of the Association, a post which his father had previously held.

Members of the executive committee were elected as follows: G. W. Brown, Gair Company (Canada), Ltd., Toronto; Wentworth Brown, Brown Company, Lachute; A. Crabtree, Fraser Companies, Edmundston; J. G. Fleck, J. R. Booth, Ltd., Ottawa; L. Killam, B. C. Pulp and Paper Company, Vancouver, and E. M. Little, Anglo-Canadian Pulp and Paper Mills, Quebec.

Three vice-presidents were named: F. G. Robinson, International Paper Company, Ltd.; C. R. Whitehead, Consolidated Paper, and R. L. Weldon, Bathurst Power and Paper Company, Ltd. The latter is on leave of absence.

The Presidential Address

In his presidential address Mr. E. Howard Smith said that membership in the Association increased by two during the year and now stood at 70. Referring to the branch office of the Association opened in Vancouver following a visit of the then president, Mr. Weldon, and Mr. Cadman, he said it was already proving of real value to the Association and to its members in British Columbia. Presenting a financial report showing a satisfactory surplus of revenue over expenditures, he said that in round figures the budget for expenditures during 1943 amounts to $153,000.00, which includes the annual grant of $53,750 to the Pulp and Paper Research Institute of Canada and $26,000 for the specialized work of the Technical and Woodlands Sections.

After describing in detail the multifarious activities of the Association and its various sections and committees during the past year, he said:

This report would not be complete without a brief reference to the part which the pulp and paper industry plays in direct support of Canada's war effort. Ever since this war started the quarter of a billion dollars of hard currency which our industry's exports have produced annually has been a major factor in the nation's war planning. The entry of the United States into the war naturally tended to direct attention away from the question of money exchange, but this quarter billion dollars which the industry's exports continue to produce is still a vital contribution. Aside from this and from our work on the "bits and pieces" program, the pulp and paper industry is doing a real war job, much of which cannot be publicized.

Canada and the United States are today the sole remaining sources of supply of pulp for the United Nations. The United States is largely occupied in supplying her own needs of pulp, paper and paper products and relies on Canada for about 75% of her consumption of newsprint and for about one million tons of various kinds of pulp including substantial quantities of dissolving pulps. The United Kingdom is dependent on Canada for the major part of her newsprint requirements and substantial quantities of Canadian newsprint are required by other parts of

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Intensive Manpower Training Course Opens

Extension Division of University of Wisconsin Starts Conservation Course at Lawrence College — Badger-Globe Mill on Eight-Hour Shift—L. C. Smith Discusses Labor Turnover—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., February 1, 1943 — Intensive training in manpower conservation by the elimination of accidents will be given safety engineers of paper mills and other industries of Appleton, Kaugauna, Neenah and Menasha, Wis., in a course opening Wednesday of this week at Lawrence College, Appleton. It will be conducted by the extension division of the University of Wisconsin, and the instructor will be Clifford B. Boulet, personnel director of the Wisconsin Public Service Corporation. David J. Trettin of the Appleton Coated Paper Company, Appleton, is assisting in the registration. He is serving as a special agent of the Wisconsin committee appointed by the national committee for the conservation of manpower.

The class will be limited to an enrollment of forty, and will meet weekly for three-hour study periods.

Clarence J. Muth, Milwaukee, Wisconsin chairman of the national committee, pointed out the need of the study because "seasoned workers were injured because of speeded operations and long hours, but the bulk of the injuries occurred among the thousands of new workers who entered plants without previous shop experience."

Industrial Commission Reports

The Wisconsin Industrial Commission's statistical department reveals that industries of the state employed 249,100 wage earners in November, 1940, and in the two years to November, 1942, the number increased to 338,400, a gain of 40%. In the same two years, the daily number of injuries reported by manufacturing industries rose from 38 to 72, a gain of 82%. In the last year, however, the daily average number of injuries increased 18.2% while employment gained 12.5%.

Mill Adopts Eight-Hour Shift

As a means of overcoming the manpower shortage, the Kimberly-Clark Corporation, Neenah, Wis., has stretched its shifts from six hours to eight hours in the crepe wadding department of its Badger-Globe mill at Neenah, effective today. The department formerly was operated on four shifts of six hours each daily. The three-shift schedule will be in periods from 6 A. M. to 2 P. M., 2 P. M. to 10 P. M., and 10 P. M. to 6 A. M.

The Lakeview-Badger-Globe Independent Union decided some months ago that when the war made such a change practical and necessary, it would be done. The manpower shortage in the mill has been obvious for some time, but the management delayed the step until now so fewer men might be affected by temporary demotion when the fourth shift was dropped.

L. C. Smith Discusses Labor Turnover

How the problem of labor turnover is being met by the Thilmany Pulp and Paper Company, Kaukauna, Wis., was described by L. C. Smith, personnel manager, in an address to the Kaukauna Rotary club Wednesday of last week.

Shifting of women employees to men's work involved the matter of work hours, pay schedule and accumulation of seniority. Mr. Smith said. These were adjusted with the labor unions by having the women work the clock around, and beginning women's starting pay although they do men's work.

Heavier work has been shifted to men doing lighter tasks so the women could be provided with less strenuous jobs, the speaker declared. In cases where the man's shift was to a job that ordinarily pays less, his former wage scale remained in effect.

Discussing recent stands taken by the War Labor Board, Mr. Smith contended that attempts to deal fairly and reasonably with employees are the best means of avoiding trouble with the board. He closed his address by showing graphs of the increases accomplished in production, and the upward curve of operating costs.

Consolidated Credit Union Reports

J. J. Plzak, claims manager of the Consolidated Water Power and Paper Company, was the speaker at the annual meeting of the Bull's Eye Credit Union, Wisconsin Rapids, Wis., January 20. The organization serves employees of the mill.

Annual reports revealed that 1,099 loans were made during 1942 for a total of $67,481.90. More than 130 new members were accepted during the last year. A total of $2,701.98 was paid out to members as a dividend of 2.4 per cent on their investment. The organization has loaned a total of $451,710.41 since its organization in 1932 and has total assets of $144,-031.47.

Lawrence Villeneuve was elected president for the ensuing year.

Delton Beaulieu Made Lieut.-Colonel

Delton Beaulieu, formerly an engineer with Kimberly-Clark Corporation, Neenah, Wis., has been promoted from major to lieutenant-colonel in the U. S. Army Engineering Corps. He is now stationed in Australia. Mr. Beaulieu is also a veteran of the first World War.

Keiding Co. Purchases Building

The Keiding Paper Products Company, Milwaukee, Wis., has purchased a two-story factory building at 3048 N. Fourteenth street from M. M. Meyer. The building contains 15,000 square feet of floor space and will provide expanded plant operations.

Safety School Session Well Attended

Approximately 200 persons braved sub-zero weather to attend the first session of the fifth annual safety school sponsored by the Twin City Industrial Safety Council of Neenah and Menasha, Wis. The gathering was held January 19 at the Menasha high school.

Dr. Charles Copeland Smith of the National Man-

ufacturers Association was the speaker, pointing out the marvelous record of industry in shifting to war production within the last two years. He credited individual initiative of both the management and the workers for the achievement. The nation is not short of manpower, he declared, but is hampered by a million man hours lost since Pearl Harbor through accidents, carelessness, sickness and sheer indifference.

G. S. Kessler, supervisor of fire prevention for the Wisconsin Industrial Commission, put on a demonstration of the dangers in handling highly inflammable material.

E. P. Sherry Estate Valued at $767,485

The gross estate of Edward P. Sherry, Milwaukee, Wis., who died August 6, 1941, amounts to $767,485.13, according to a determination of the court for tax levying purposes. Mr. Sherry held capital interests in Wisconsin paper mills, and was president of the Flambeau Power Company and of the Chippewa and Flambeau Improvement Company, whose operations were linked with the Flambeau Paper Company, Park Falls, Wis.

Wisconsin inheritance taxes on the estate amounted to $58,734 and federal estate taxes totalled $100,865. The estate was left to the widow, a son, Avery, and two grandchildren.

Mill Sets Good Bond-Buying Poll

A survey as of January 1 revealed that 93.5% of the employees of the Lakeview mill of Kimberly-Clark Corporation, Neenah, Wis., had subscribed to the payroll deduction plan for war bonds, promoted by the Lakeview Mill Independent Union. For December there was an increase of $950 in subscriptions throughout the mill. Of the 1,305 persons enrolled, 93 percent of the hourly paid workers are included, and 96.6 of the salaried group. Two entire departments, materials and personnel, have signed up 100%.

Badger Carton Co. Acquires Building

The Badger Carton Company, Milwaukee, Wis., has recently purchased a building from the Crane Company, located at 225 W. Capitol drive. The plant will be moved there about February 1. The purchase was made necessary because the Badger company's plant on N. Bremen street is to be taken over by the government.

Kimberly Credit Union Reports

The Kimberly Credit Union, serving employees of Kimberly-Clark Corporation at its mill at Kimberly, Wis., made loans of $57,874.43 during the year 1942, according to reports made at its annual meeting January 18. Harold Hoolihan was elected president to succeed Ray Haase.

Paper Indexes Lower

WASHINGTON, D. C., January 27, 1943—Index of the value of paper and allied products manufacturers' inventories, using the average month of 1939 at 100, was 146.2 for November 1942 compared with 149.8 in October, and 132.0 for the November a year earlier.

Paper manufacturers' shipments indexes were 143 during November, compared with 146 in October, and 175 for November 1941, using the same average month in 1939 at 100.

Dur-I-Cell System

The Dur-i-cell System, Maurice Deutsch, patentee, 35 Maiden lane, New York, utilizes various types of raw paper for chemical treatment to produce many products to take the place of wood, plywood and steel used in concrete construction and in other applications.

Acocrding to the inventor, the Dur-i-cell method of treating paper board, corrugated, solid fiber, kraft or chip, is adaptable for processing in the mill or in the outside converting plant. Mr. Deutsch states that paper board thus treated possesses greater strength, is water and fire resistant, vermin and fungi proof and of high insulating value.

The many applications, states the inventor, include square collapsible forms for foundation piers, ducts, etc., paper cores and forms to remain permanently in place; insulation in single or multiple sheets for ship construction; thermal insulation for refrigerating boxes; containers of greater strength and durability; cement or other lined paper pipe, used as ducks, conduits, etc., and replacing wood, metal and clay products. For military uses, paper tubing is processed to provide shock absorbing and incendiary bomb protection on land and on the sea; special boxes to replace sand bags; paper tubes utilized to make non-sinkable pontoons, landing and working platforms, life rafts, etc.

Among the advantages claimed for the Dur-i-cell method for fire-resistant housing construction, are saving in steel for nails, bolts, etc., less skilled labor, less material weight to transport, less time for erection and lower cost in construction, fuel and maintenance.

Waste Dealers to Meet March 16-17

The Thirtieth Annual Convention and Wartime Conference of the National Association of Waste Material Dealers, Inc., is to be held at the Hotel Sherman, Chicago, on March 16 and 17. The Association having eliminated its Fall Convention in 1942, the convention to be held in Chicago in March is the only opportunity that will be available in 1943 for the waste material trade as a whole to come together for consideration and proper action on problems directly connected with the war effort and it will also be an opportune time for various war agencies in Washington to contact the entire trade at one point.

Among the divisional organizations to hold meetings will be the Waste Paper Institute and the Associated Rag Industries.

Orders Maximum Loading of Newsprint

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 1, 1943—In order to facilitate dispatch of newsprint, and to overcome as much as possible difficulties occasioned by weather conditions and car shortage, the Transport Controller for Canada has issued an order that cars used for the conveyance of newsprint must be loaded to their maximum capacity. For instance loads 60 inches or greater in width must be loaded on end with not less quantity than that which occupies the entire floor area of the car. Rolls of from 45 inches up to but not including 60 inches must be loaded one tier on end plus a second tier, loaded on sides or ends, and so on.

Heavy Paper Orders Continue in Midwest

Merchants Find it Increasingly Difficult to Fill Unprecedented Large Orders—WPB Specifications For Folding Boxes Trouble Retailers—Salesmen Review Business Situation—Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., January 25, 1943—There is no end to the troubles of the Chicago paper market in trying to fill the unprecedented amount of orders for paper coming in by waves as the news of pulp curtailment and potential further curtailments reaches the trade. Additional news concerning man power shortages, inability of the mills to speed up production even with available supply, has all contributed to a "bullish" market. It is not so pleasant, say Chicago paper representatives, to see paper go out that may not be replaced, at least for some time to come.

Specifically, groundwoods and newsprints showed the most discernible tightening up according to local observers. Waste papers were reported to be in stronger shape as weather impeded collections and as raw pulp sources were drying up to force conversion. Krafts were very strong but here, as in virtually all cases, the backlog of orders was piling up until well into the late Spring, according to local reports. Books and covers were strong and in all instances prices were bumping the ceiling talks. The February meetings of the industry in New York were becoming more and more important and essential as "indicators" and as necessary charts for future procedure in a grave situation.

Speaker Urges Accident Prevention

Speaking under the auspices of the National Safety Council on January 21, W. A. Irvin, national chairman of the War Production Fund to Conserve Manpower, warned industry that if its leaders do not give full support to the nationwide effort to minimize man power losses through preventable accidents, the government will take full charge of national safety activity. He urged that the movement to curb accident losses be given substantial financial support to insure an adequate educational activity designed to foster safety consciousness throughout the country. "Add to the 96,000 killed in accidents in the twelve months period ending December 6, 1942, some 155,000 who have been disabled," he said, "and we have a total well over a quarter of a million able-bodied war workers. Add the fact that more than 4,000,000 workers are hurt in accidents every year and we face the fact that some 500,000,000 man days of production are lost to us—especially in this time of war."

Mr. Irvin declared that industry had not yet realized the vast influx of new war workers into factories and the growth of the need for safety training. He said, "we must establish more safety councils. Yet the councils are not getting a cent more for this work." He warned that "our war time record production drives engender accidents and that we'd be better off if we didn't make so many records at the expense of skilled labor" and concluded with the warning of the importance of making safety consciousness a live issue on all lines.

A number of members of the paper and allied industries were present at this meeting where all manufacturers and others in varied lines were warned that Mr. Irvin's warning should be taken into every town, city, hamlet and industry in the country.

Folding Box Situation Trouble Retailers

Chicago merchants were given to understand this week that there was nothing further to do about the folding box situation but to wait until actual WPB specifications came along and then to make formal protests. Retailers in the larger establishments continued to voice their consternation over the possibility of having to deal with folding boxes made from waste papers which would, according to their comment, defy even the most careful kind of handling and encourage theft, loss, spoilage and customer dissatisfaction. At a recent meeting of the Chicago Retail Merchants Association announcement was also made that Christmas boxes would be a thing of the past in 1943 except for a plain box with possibly a printed "Merry Christmas." This was the news the retailer got a year ago that led to serious curtailment at a time when such curtailment cost the box makers a lot of holiday box business.

Salesmen Review Business

The western division of the Salesmen's Association of the Paper Industry spent the Monday noon, January 16, meeting hour in a review of current conditions which indicated that demand continued very heavy. Courtney Reeves, president of the Association, also read and had approved a letter of condolence and sympathy which was sent to Jim Coy in Haverford, Pa., where he was attending the funeral services of his son, Jim, Jr., who was killed in an automobile accident last week. Jim, Jr., was a former member of the western group.

Urges Sulphite Liquor as Alcohol Source

The Chicago Tribune uses a first page editorial this week to state that "The Rubber Problem Is Solved." It refers to testimony given by scientists to the Senate committee investigating the rubber program. Dr. Hall is quoted as having said that he "was perfectly happy and satisfied" with the Ontario Paper Company's project in making rubber out of pulp mill by-products including sulphite liquor. The article points out that much of the alcohol that may be needed in the rubber program can be derived from sulphite liquor alone and "that all that is likely ever to be needed can be obtained from sawdust and other waste products of the wood-using industries. The Ontario Paper Company has invited every one in the industry to make free use of its methods and concludes with the statement that "if the people of this country want tires all they have to do is to insist that the bureaucrats in Washington allow us and other wood users the materials needed for alcohol and rubber plants. The raw material is plentiful, costs nothing, and its use in making rubber will not deprive the nation of anything needed for another purpose."

Many Mills Gain by New Production Plan

Majority of Canadian Newsprint Manufacturers Benefited By Adjustment of Operations Adopted as War Measure—Positions of Abitibi and Consolidated Changed—Ratings Given—Other News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., February 1, 1943—According to the established position of each Canadian newsprint mill as made public last week, 15 of the 25 mills better their position in respect to their share of the available business, based on rated capacity. Other factors, such as orders on hand, rate of operations, shipments, etc., influenced the established position, so that the "rated" capacity of each individual operator undergoes an upward or downward adjustment from the previous rating.

As far as can be learned the positions established have been received favorably by the industry.

The percentage of total business available accruing to each operator, in order of importance, is given by the *Financial Post* as follows:

	Per Cent Total Business
Canadian International Paper	15.89
Abitibi	13.01
Consolidated	12.90
Price Bros.	8.52
Powell River	5.65
Spruce Falls	4.84
Anglo-Canadian	4.70
Ontario-Minnesota	4.31
Ontario Paper	4.28
St. Lawrence Paper	4.11
Quebec-North Shore	3.32
Mersey	2.68
Great Lakes	2.76
Lake St. John	2.30
Maclaren, James	2.30
Donnacona	1.87
Pacific Mills	1.85
Donohue Bros.	1.07
Eddy, E. B.	1.00
Brompton	.93
Beaver	.60
Bathurst	.39
Booth, J. R.	.30
St. Raymond	.30
Provincial	.12

Abitibi replaces Consolidated in second place according to the new ratings, as compared with the old ratings and Ontario Paper moves up from 11th position in respect to capacity to ninth place in the new listing. St. Raymond moves from 25th to 24th place and Mersey from 13th to 12th position. James Maclaren Co. improves its position slightly, being on a par with Lake St. John Power and Paper, which previously had a slightly higher rating on a capacity basis. The relative position of the other companies remains unchanged.

Dryden Operations Well Maintained

President F. A. Sabbaton told shareholders of Dryden Paper Company, Kenora, Ont., at the annual meeting of that company recently that since the installation of the new digester equipment, the mills were in good shape and operations were continuing at a high level.

Referring to the dividend policy, Mr. Sabbaton said the directors deemed it advisable to build up substantial cash reserves to cope with any uncertainties that may arise, rather than pay out small amounts. The amount to be made available for excess profits tax, he added, had not yet been determined.

Replying to an enquiry from a shareholder, J. R. S. McLernon, a director, stated that the company had a large surplus of kraft paper. Exports were small and practically all the production could be absorbed in Canada. If new machinery could be obtained, he continued, the company could substantially increase production, but priorities prevented any such move.

Canada Northern Sells Pulp Unit

Canadian Northern Paper Corporation has sold its pulp mill property to the Canadian Splint and Lumber Corp. The mill has not been in operation for several years. Extensive alterations will be necessary to the building, preparatory to the production of match splints.

When in operation, the power requirements of this plant will be in the neighborhood of 500 h.p.

Bits and Pieces Exhibit

An exhibit presented at the 1943 convention of the Canadian Pulp and Paper association being held at Montreal is the variety of parts of machinery that are being turned out by the industry in connection with war production. In this work some 66 shops are participating and these belong to 17 pulp and paper companies.

Expect Higher Newsprint Prices

As an indication of the confidence felt by financial interests that there will be an upward adjustment in newsprint prices, a leading financial sheet in Toronto advises a reader concerning Consolidated Paper bonds that "Under present restrictions of output and rising costs, it is doubtful if revenues for 1943 will be as large as they were in 1942, but, on the other hand, it is possible there will be an increase in the selling price of newsprint which should help to re-establish earnings of the company."

To Serve as a Silent Salesman

The unusual requirements of the war period have been taken into consideration by the Harvey Paper Products Company of Sturgis, Mich., in its new 1943 catalog, just off the press. It has been recognized that gasoline and tire rationing, and the necessity of reserving rail transportation for men in service, will make salesmen's calls less frequent. As a result, the book has been designed to serve as a "silent salesman."

It has been made much more comprehensive than previous editions, graphic illustrations have been added, and an effort has been made to include all information a jobber or his salesmen might need about each product.

Ways are pointed out in which the jobber's customers can save valuable fats and oils, prolong the life of pan equipment, reduce returned merchandise and cut labor costs. A copy of this timely new catalog will be sent any paper jobber on request.

Preliminary Program for Convention of National Paper Trade Association

Waldorf-Astoria Hotel, February 14-17, 1943

The fortieth annual convention of The National Paper Trade Association will be held at the Waldorf-Astoria Hotel, New York City, February 14 to 17, inclusive.

The following is the preliminary program for the convention:—

Sunday, February 14

Registration—Lounge Restaurant, Lobby Floor.

2:00 P. M. Meeting of Executive Committee—Pillement Suite

Monday, February 15

9:00 A. M. Registration—Basildon Room, 3rd Flr. Exhibits Open—9th Floor.

10:00 A. M. Wrapping Paper Merchandising Committee—Assembly Rooms J K.

2:30 P. M. Open Industry Meeting — Starlight Roof. President R. C. Kettles, Jr., presiding.

Speakers—

Senator James E. Murray of Montana, Chairman, Senate Small Business Committee.

Arthur D. Whiteside, President, Dun & Bradstreet, Inc.

Tuesday, February 16

10:00 A. M. Fine Paper Division—Jade Room. Former President P. W. Lesh presiding. Address: Industry Prospects, E. W. Tinker, Executive Secretary, American Paper and Pulp Association. Annual Survey and Discussion.

2:00 P. M. Wrapping Paper Division—Jade Room. Vice-President C. E. Roach presiding.

Guest Speaker—

Charles M. Piper, Industry Council, Office of Price Administration.

Forum—Discussion led by members:

Paper—A War Product, M. S. Dilts.

Civilian Needs and Public Health, L. S. Atholz.

War Time and Post War Merchandising, H. J. Voelker.

Annual Survey Report.

Tuesday, February 16

5:00 P. M. Fine Paper Governing Committee, Assembly Rooms J K.

5:00 P. M. Wrapping Paper Governing Committee—Assembly Rooms L M.

8:30 P. M. Board of Directors—Assembly Rooms L M.

Wednesday, February 17

10:00 A. M. —Wrapping Paper Division — Jade Room. Vice-President C. E. Roach presiding. Subject: Governmental Regulations. Address: W. G. Leathers, Paper Section, Office of Price Administration.

2:30 P. M. Annual Meeting, N. P. T. A. — Jade Room

President R. C. Kettles, Jr., presiding. Official Reports. Address of Counsel.

Boston Paper Men in the Service

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., February 1, 1943—William Dempsey, Jr., warehouse man of the Century Paper Company, has gone into training as Naval Aviation Cadet. He is a son of "Bill" Dempsey, of the Century Paper Company.

John Carter & Co., Inc., are displaying in their window a service flag containing stars for those in the service, of whom there are 16, including one young woman. The flag was made by one of the young women on the staff of the firm. Besides these, there are 20 in plants on war work.

From the Fort Hill Paper Company, there are three men and one young woman in the service, the latter in the WAACS.

Discuss Nitrocellulose Allocation

WASHINGTON, D. C., January 25, 1943—The January allocation pattern for nitrocellulose was discussed by members of the Pyroxylin and Vinyl Rosin Coated Paper and Fabric Industry Advisory Committee at a meeting here.

Nitrocellulose is freer in January than in previous months, and present indications are that February allocations will be relatively the same as those of January, members were told. It was pointed out that end uses may change from month to month.

It was suggested that members of the industry pool their tank car facilities to relieve as much as possible the tank car shortage. Office of Defense Transportation Order 18 on maximum car loadings was discussed.

Everett G. Hara Gets Patent

[FROM OUR REGULAR CORRESPONDENT]

WATERVLIET, N. Y., January 29, 1943—Announcement is made by the Behr-Manning Corporation that Everett G. Hara, of Troy, has been granted a patent by the government on his invention of coated abrasive. The patent consists of waterproof sandpaper, including a paper backing containing regenerated cellulose as an agent to impart wet strength, a water resistant paper treatment and a binder for abrasive grains and abrasive grains held in the backing by a binder. Patent rights have been assigned to the Behr-Manning Corporation.

Obituary

Ernest E. Lloyd

Ernest E. Lloyd, president of the E. E. Lloyd Paper Company, Chicago, Ill, died, January 19 at Los Angeles, Cal., while on a business trip.

He was born near Toronto, Ont., Canada and after completing his schooling accepted a position with the W. J. Gage Company of Toronto, dealers in school supplies and gained his first knowledge of paper by being placed in the flat paper department. After a few years with this concern he came to Chicago and associated himself with the Calumet Paper Company for whom he was a salesman. When that concern was taken over by the Whiting Paper Company, Mr. Lloyd joined the Whiting organization in the capacity of salesman. After a number of years with this concern he associated himself with Mr. W. E. Wroe in the W. E. Wroe Company who were dealers in fine papers, and was made a member of the firm.

In 1909 Mr. Lloyd left the Wroe Company to found the E. E. Lloyd Paper Company and has been its president since its organization.

Surviving are his widow, Marjorie, a daughter, Mrs. Robert C. Anderson, Jr., of New York and a brother, C. M. Lloyd, who has been associated with the business since its inception as secretary and treasurer.

Thomas S. Hurlock

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., January 25, 1943—Thomas S. Hurlock, president of the Hurlock Bros. Co., 3436 Market street, manufacturers of cardboard, died on Saturday last at his home in Springfield, Delaware County. Mr. Hurlock was born in Galena, Md., and had lived in Philadelphia for many years. He was a descendant of Anthony Morris, second Mayor of Philadelphia.

He was an active churchman and a Mason, and was instrumental in founding the Springfield Community Church, and for many years headed its board of trustees.

Surviving are his wife, Elma Rawley Hurlock; a son, William C. Hurlock, of Drexel Hilll; a daughter, Mrs. W. H. Chaffee, 2d, of Swarthmore, and three grandchildren.

Funeral services were held Tuesday at his late home, 62 South Hillcrest avenue, Springfield, with interment in Arlington Cemetery.

W. H. Artz

W. H. Artz, of the Western Glucose Manufacturing Company, East Pittsburgh, Pa., who died last fall was born April 26, 1885, in Dayton, Ohio. He joined Westinghouse Electric and Manufacturing Company, June 1, 1911, upon graduation from Ohio State University. Completing the graduate student course at Westinghouse, he became a sales correspondent.

In 1920 Mr. Artz was appointed manager of the Paper Mill Electrification Section of the Company. He retained these duties as part of the general mill electrification group until his death.

Mr. Artz was the official Westinghouse representative in the Technical Association of the Pulp and Paper Industry.

He is survived by his widow, Margaret, and daughter Elizabeth.

Wilbur W. Winship

Wilbur W. Winship, 62, sales manager of the Miami-Oxford Paper Company, Dayton, Ohio and former member of the Franklin board of education, died at his home, 324 Hill avenue, following a heart attack last week.

Born in Germantown, he came here when a young man. After working in the freight office of the Big Four railroad, he went to Bellefontaine for several years. He had been with the Miami-Oxford company for 26 years.

Surviving are his wife, Edna; a daughter, Mrs. Roy Knudson, Detroit, Mich, a son, Frederick, a student at DePauw university, Ind., and a half brother, Frank Dunifer, West Carrollton.

Stuart H. Brown

Stuart Harrison Brown, 68, retired executive of the Union Bag and Paper Corporation, died suddenly at his home in Miami, Fla., after a heart attack on January 19.

Mr. Brown had been with the Union Bag & Paper Corporation for more than 35 years prior to his retirement in the summer of 1940. At that time he was secretary of the corporation. Earlier, he had held a number of other positions, among them manager of the traffic and insurance departments.

Funeral services for Mr. Brown were held in Miami, January 21. He is survived by his wife, Mrs. Viola C.; a sister, Mrs. Fred H. Daniels of Newtonville, Mass.; and a nephew, H. Stuart Daniels, vice-president of the Union Bag and Paper Corporation.

W. B. Strait

Wallace B. Strait, 57, secretary and director of the John Leslie Paper Company, Minneapolis, Minn., died January 7 at his home, 4600 Abbott avenue S.

He had been associated with the Leslie company for 40 years and was widely known among newspaper men and merchants of the Northwest.

Julius Warren Sheppard

Julius Warren Sheppard, president of the Sheppard Envelope Company, Worcester, Mass., since its inception, 1921 to 1943, died January 5.

H. H. Latimer to be Mill Manager

Homer H. Latimer, Hamilton, Ohio, has been named mill manager of the Hamilton plant of the Champion Paper and Fibre Company at Hamilton, Ohio. The announcement of his advance was made by Logan G. Thomson, president of Champion, and Clarke Marion, vice president, whom Mr. Latimer succeeds. Mr. Marion now is required to spend most of his time in Washington.

Mr. Latimer went to Champion six years ago from the Beckett Paper Company, Hamilton, as assistant superintendent. On October 13, 1941, he was appointed assistant mill manager, and now succeeds to full management of the property.

CANADIAN PULP AND PAPER ASSOCIATION MEETS

(Continued from page 7)

the Empire and by other United Nation countries including our good neighbors in Latin America.

War Requirements of Pulp

Of all pulp produced in Canada for sale, about 90% is exported and in addition to the substantial tonnage shipped to the United States, our pulp mills supply all of Canada's requirements and practically all of the United Kingdom's requirements of nitrating pulp for the manufacture of explosives and the total of both the United Kingdom and Canada's requirements of dissolving pulps for making rayon yarn, staple fibre, plastics, cellophane and allied products of essential war need.

Canadian paper and paper board, made from Canadian pulp, Canadian waste paper and Canadian rags are used for such war essentials as shell containers, packages for the distribution of the parts of war equipment, packages for food and clothing for the Armed Forces, charts, maps, blueprints and instruction books, as well as for the forms and correspondence necessary to the operation of the Army, Navy and Air Force.

Our industry's exports, which constitute about 80% of the value of our production, are now shipped exclusively to United Nation countries and since all these export shipments must first be licensed by the countries receiving them, it follows that they must constitute essential war need to those countries, otherwise the necessary import licenses would not be issued.

Prospective War Demands

The United Kingdom's present consumption of paper including newsprint and paper products is about 40% of her pre-war use. This drastic reduction has been accomplished while Britain was fighting a defensive war, but as the offensive on which we have now embarked develops, it seems reasonable to expect that there will be a substantial increased war need for the products of our industry, first to maintain the more widespread operations of our Armed Forces as to communications, packaged food, containers for shells and ammunition, nitrating pulp, etc., and second, to meet the needs in the occupied countries as they are liberated.

Our industry, in common with other Canadian industries, is now faced with many problems. There is a shortage of electric power and there are potential shortages of manpower and of wood as well as of many other raw materials and supplies. There is the possibility that our operations will be further curtailed by Government action, but whatever the problem, this industry possesses the necessary brains and ability to meet them. We will continue the policy that we have followed for many years, mainly, to cooperate to the utmost extent with our Government; standing always ready to apply in an objective way for the speeding of the national war effort, our practical experience on industry matters; pursuing our traditional policy of not posing problems to the Government without concurrently proposing some practical solution. It is in this realistic spirit that we face another war year determined by our efforts to speed the day of victory.

Bits and Pieces Achievements

The opening luncheon gathering at the three-day convention was sponsored by the Association's Wartime Machine Shop Board, which organized "bits and pieces" manufacture in the machine shops of the mills and channeled orders to the 66 shops participating. Since April, 1941, the shops have turned out over $3,000,000 of war orders, and they are now operating 16,000 man-hours per week on an additional $2,750,000 of orders, with prospects that total 1943 production will run from $3,000,000 to $4,000,000.

Presiding at the luncheon was E. Howard Smith, of Howard Smith Paper Mills, Limited, who is chairman of the Machine Shop Board. Both spoke with satisfaction of the achievements of the shops, and the latter thanked the primary war contractors who had supported the scheme with sub-contracts, which latter were undertaken on a non-profit basis.

A striking display of typical bits and pieces and complete equipment units fabricated by the pulp and paper maintenance machine shops with surplus capacity of tools and labor, was on exhibition in a room adjoining the convention hall. It included a wide variety of products, ranging from bolts and screws, to gun mounts, parts and components for tanks, and parts, turning engines, valves, and other equipment for both naval and cargo boats.

A feature of the convention was the presence of 5 machine shop workers from Ontario, Quebec, and the Maritime Provinces to take part in a one-day session on sub-contracting. The men were representatives of their fellow workers charged with taking back to them the fruits of their visit. They inspected the Machine Shop Board exhibit and compared notes on what other mills were doing. In the afternoon they visited one of the big munition-manufacturing plants in Montreal.

Presentation of Awards

At a luncheon of the Woodlands Section the Ontario Paper Company's award for the best paper in 1942 on logging mechanization was presented by Capt. A. A. Schmon, president of the company, to H. M. Wilson, Price Brothers and Co., Limited, Rimouski, Que. The Price Brothers and Company's award for the best paper on subjects other than mechanization was presented by Major Edward Flynn, vice-president of the company, to Maurice Gerin, Anglo-Canadian Pulp and Paper Co., Limited, Quebec. A third presentation was the Ellwood Wilson award for effective industrial application in 1942 of this section's study on efficiency in cutting pulpwood. Ellwood Wilson himself received from F. G. Robinson a bronze plaque (the award named in his honor) and the recipient for 1942 was E. R. Goulet, Canadian International Paper Company, Montreal.

P. H. Scowen, general manager of Brompton Pulp and Paper Company, Limited, announced establishment of the J. A. Bothwell award for meritorious achievement in forest conservation.

At a luncheon of the Technical Section the I. H. Weldon gold medal and the technical service award was presented. The Weldon medal is awarded annually to the senior member of the section who pre-

sented the most outstanding technical paper at the previous annual meeting. The medal, donated by A. L. Dawe, in memory of the late I. H. Weldon, past president of the Canadian Pulp and Paper Association, was presented to J. D. Brown, groundwood superintendent, Canadian International Paper Company, Three Rivers. The paper read by Mr. Brown at the 1942 annual meeting was entitled "Studies in Classification and Refining of Groundwood Pulp."

The Technical Section service award, presented this year for the first time, is an award made available to the Technical Section from a die presented to the association by F. G. Robinson, vice-president. This award is made annually to the chairman, or member of a technical section commitee, who has contributed most toward the furtherance of the aims of the Technical Section. The award for 1942 was made to F. W. Bradshaw, assistant chief engineer, Consolidated Paper Corporation, Limited, chairman of the engineering committee of the Technical Section.

Mr. Bradshaw and his committee have made an outstanding contribution to the industry in the summaries on conservation and substitution of critical materials that have been prepared and published.

It was announced by J. N. Stephenson that the trophy for the safest mill in Canada among the big plants had been won by the Mercury Paper Company with their mill at Liverpool, N. S., while that for smaller mills had been awarded to Lotbiniere Pulp and Paper Company which had a perfect record of no accidents during the year. Mr. Stephenson said that the Mercury Mill had a safety index of 2.06 and was followed very closely by the Kenogami Mill, which had an index of 2.17. He presented the trophy to Mowbray Jones, representing his father, Col. Jones, of the Mercury Paper Company.

Election of Section Officers

The following officers of the Technical and Woodlands Sections were elected for the ensuing year:

Technical Section.—H. D. Hyman, general manager of J. R. Booth, Ltd., of Ottawa, chairman, in succession to E. D. Hyndman, general superintendent of the Anglo-Canadian Pulp and Paper Mills, Ltd. New technical section councillors are Dr. A. C. Hill, research director of Anglo-Canadian; and A. E. H. Fair, Cornwall division manager of Howard Smith Paper Mills.

Woodlands Section.—Re-elected are W. G. Wright of Price Brothers and Co. as chairman, and J. V. Perrin of Brown Corp. as vice-chairman. Councillors for 1943 are R. G. MacFarlane, Fraser Companies, Ltd.; F. Faure, Consolidated Paper Corporation; E. B. McGraw, Ontario Paper Company; L. A. Nix, Bathurst Power and Paper Company; G. W. Phipps, Spruce Falls Power and Paper Company; A. W. DeLand, Power River Company; H. G. Schanche, Abitibi Power and Paper Company, and ex-officio, V. E. Johnson, J. O. Wilson and W. A. E. Pepler.

Crystal Tissue Earns 92 Cents

The Crystal Tissue Company for 1942 reports a net income of $104,903, equal, after preferred dividend requirements to 92 cents each on 93,000 common shares, against $152,264, or $1.42 a common share in 1941; net sales, $2,505,343, against $2,943,939.

For Better Lighting

The problem of better lighting in both manufacturing and service industries to meet wartime demands for increased production, improved products and greater safety and comfort for workers will be studied by the newly organized Industrial and Commercial Lighting Equipment Section of the National Electrical Manufacturers Association, according to an announcement by its chairman, E. C. Huerkamp, manager, Lighting Sales, Westinghouse Electric and Manufacturing Company, Cleveland, Ohio.

"By combining the two NEMA Sections dealing with industrial and commercial lighting equipment into the new Section, we hope to develop ways and means of making the 'lighting tool' more easily available and thus provide a better service to industry and the war production effort," Mr. Huerkamp declared. "The realization that good lighting is an industry tool is being increasingly recognized by industry. Through the new NEMA Section and the work of its several Committees we will deal, as a representative industry group, with every phase of good lighting practice. It is our purpose to lend all possible assistance to the war effort and post-war planning in these fields."

A. F. Wakefield, vice president, The F. W. Wakefield Brass Company, is vice chairman of the NEMA Section and Frank J. Martin, of NEMA, is the recording secretary.

Acme to Sell Champion Stitchers

The Acme Steel Company, Chicago, has assumed the distribution and sale of Champion Carton Stitchers and parts according to an announcement made by Hoffert Machine Company, Inc., Racine, Wis.

Present users of Champions are being formally notified of the change and Acme Steel has already arranged for replacement parts to be readily available through its branches located from coast to coast.

Service of Champion equipment will also be handled by the Acme organization whose manufacture and sale of carton stitching wire as well as its own machines, known as Acme Silverstitchers, gives them a background of experience which will be helpful to Champion users.

Also announced were additions to the Acme Silverstitcher line of carton closure equipment which include top and seam stitcher as well as the present bottom, straight arm and combination.

N. E. Paper Merchants Choose Delegates

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., January 25, 1943—At a meeting of the board of directors of the New England Paper Merchants Association January 19, the following elected as delegates to the National Paper Trade Association for the fiscal year starting March 1, 1943, will serve as directors of the National Association:

Representing the Fine Paper Division, John R. Whitney, Whitney-Anderson Paper Company, Inc., Springfield, Mass. Alternate, J. Francis Halloran, Century Paper Company, Boston. Representing the Wrapping Paper Division, James C. Campbell, Industrial Paper and Cordage Company, Pawtucket, R. I. Alternate, Samuel L. Ginsburg, Ginsburg Brothers, Inc., Somerville, Mass.

Waterproof Paper Products vs. Paper Strength

By J. A. DeCew, Chemical Engineer

At the very time when raw materials are at a premium, the demand has arisen for paper products of superior water resistance and at the same time, superior strength. These two properties have always been at war with each other but now they are required to become allies and modify the warring elements. The strength of the paper products depends upon the binding action or adhesion between the fiber surfaces and if any material comes between these surfaces which is weaker in itself than the fiber adhesion, the strength of the paper is materially affected.

Every paper maker knows that a waterleaf paper has the maximum strength that can be produced from given fiber.

Water-Resistant Materials

The materials that are mixed with pulp fibers to produce water resistance are extremely few, namely rosin, wax and asphalt, which are aided and abetted by sulphate of alumina. Each of these materials have certain distinctive properties.

Rosin is a hard material with some adhesive or binding strength, but which is less than the adhesion between the fibers of a strong paper. Combined with alumina under proper conditions, it becomes extremely water-repellent and paper making fibers can be combined with this material in such a way that their capillarity is almost completely removed. This property however, depends more upon how the rosin and alumina are combined and not upon the nature of the ingredients.

Paraffin wax is a soft and amorphous material, having a maximum resistance to water but no adhesive strength whatever, and actually acts as a lubricant when placed between fiber surfaces.

Asphalt is a tarry-like material, having properties inferior to wax or rosin as a water-repellent, and inferior in strength to rosin as a binder, when incorporated with pulp fiber.

Sulphate of alumina is the coagulant for emulsions made from these three materials. It contributes directly to the water resistance, but in excess it is destructive to the strength and life of the fiber.

Since all of these materials are injurious to the strength of the paper, a real problem arises when it is required to produce the maximum water resistance and at the same time have a permanently strong paper.

Rosin Has Least Effect on Strength

Of these ingredients, the one having the least effect upon the strength of the paper is rosin. It is known however, that anything over 1% of rosin will reduce the Mullen test of a kraft paper to a noticeable extent.

In waterproofing a strong paper therefore, some strength must be sacrificed but it need be only a small proportion of that which is generally lost by common practices. Strong papers are very sensitive to mistreatment with the coagulant alum and may lose from 10% to 20% in strength within a short time after they are made. Therefore, all paper products made to a specified strength test should be retested a week after they are made to check their durability.

To maintain the strength of a paper it is necessary to not only use those ingredients that are the least injurious to the adhesion between the fiber, but they should be used in such a way that the waterproofing effect is obtained with the least amount of these materials.

The economy is entirely secondary to the maintenance of fiber quality and to prevent the useless waste of critical material.

No Satisfactory Substitute

Through all the years of research in waterproofing paper no satisfactory substitute has been found for rosin and yet this material is often used in such a way that inferior waterproofing is obtained. This fact stimulates the search for auxiliary materials to increase or prevent the loss of its inherent properties. Such material however, may introduce other properties not desired in the paper.

Much is being said these days about the "Know-how" which is a new expression to describe a certain kind of knowledge and experience not found in publications of any kind. The idea seems to be that trained men who have been able to solve certain difficult problems under one set of conditions, can use that experience to solve similar problems under different conditions. This principle applies also to the production of new paper products which require new properties to a superlative degree and results that have been accomplished in one plant should be obtainable by using the same principles in another plant when the proper experience is available.

Fundamental Principles

Complicated and controversial as the subject of waterproofing may be, there are certain fundamental principles dominating the chemical reactions between rosin emulsions and sulphate of alumina and between cellulose and sulphate of alumina. It requires an exact control of these reactions in order to treat both the rosin and cellulose to just the right degree to develop the water resistance without injury to either material. This can be done however, with the proper equipment and materials so that very little of the natural strength of the fibers will be lost in making the water-repellent paper product.

More Cooperation Needed

Under war conditions, any technical experience which may contribute to national efficiency should be made available and utilized as widely as possible. This is already being done but such cooperation could be greatly extended.

Waxed Paper Under Dollars Ceiling

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 3, 1943—Approximately 65 percent of the waxed paper sold in this country will be brought under specific dollars and cents ceilings at levels generally 1½ percent below present ceilings, OPA has announced.

The balance of waxed paper remains under present ceilings, based on October 1-15, 1941 prices, but specific maximums for household rolls, which represent 15 percent of the output of waxed paper, will be issued in the near future.

The new ceilings are contained in Maximum Price Regulation No. 307—Waxed Papers—and become effective February 20. Producers whose base period prices permitted sales above the new tops will have to revise their lists downward. On the other hand, the regulation will give relief to those manufacturers who were caught with unduly low prices in October, 1941.

The regulation directs manufacturers to establish ceilings for all types of waxed paper, except cutter box or household rolls, by the following three methods:

1. For bread wrappers, sealing wrappers, waxed bleached sulphite and a large number of other listed products, the ceiling for manufacturers and jobbers is set out in dollars and cents for the type, weight, grade or other characteristics. Manufacturers must continue to give their customary discounts or differentials, which provide jobbers a selling margin.

2. For products not covered by specific ceilings but sold during October 1941 from published price lists, manufacturers' and jobbers' ceilings will continue to be the sellers' price in effect in October 1941.

3. For the few products which cannot be priced under either of the above two methods, manufacturers determine ceilings by a formula based on October 1941 cost of materials, conversion and margin. As a result, the maximum prices for these specialty items will be comparable to those of other waxed paper products.

The products covered by Regulation No. 307 formerly were under Maximum Price Regulation No. 129, which establishes ceilings for a large number of paper products at levels generally prevailing from October 1-15, 1941. Through Amendment No. 14 to Regulation No. 129, waxed paper products subject to the new regulation are removed from No. 129, effective February 20.

The lines on which specific dollars and cents prices are now set are printed opaque roll bread wrappers, inner wrappers, spot printed sheet bread wrappers, certain grades of miscellaneous plain waxed paper, printed opaque carton sealers, and super transparent sulphite bread wrappers. They represent items generally sold by the manufacturer direct to the user.

Leading waxed paper items which are controlled by a formula or published price lists, including a number generally handled by middlemen, are waxed kraft, waxed glassine, delicatessen papers, interfolded, florist tissues, waxed greaseproof, twisting tissues, can liners, and oiled and petrolatum treated papers.

The dollars and cents ceilings in the new regulation were adopted after a study of selling prices and costs and consultation with the industry. The regulation recognizes established trade practices.

Paper Demand Shows Increase

INDIANAPOLIS, Ind., February 1, 1943—Paper demand for many grades showed an increase during the last week over the general average for January. This increase is expected to be maintained now into the spring season. Supplies in many items are light and in some instances not sufficient to take care of demand. Prices are about as high as they can go.

The wrapping paper and bag demand showed a decided increase last week with retail conditions recovering after the holiday splurge of buying. Tissues also were moving well during the week.

Paper container factories continued to operate at capacity and are beginning to feel the acuteness of the labor situation. Many central Indiana plants are finding it increasingly difficult to maintain their labor forces. The percentage of women being used in paper factories is increasing steadily and yet there is a labor shortage and the general wage scale is climbing. Many of the local container plants are making supplies largely for defense plants and thus far have had little trouble in securing raw materials.

The fine paper demand continued good. There are some large book publishing houses in this section and they will be hit by the WPB limitation order which curtails the amount of their paper use 10 per cent during the current year.

Revise Method of Quoting Newsprint

WASHINGTON, D. C., February 2, 1943—Sellers of newsprint paper to the United States Government may make their quotations on an f.o.b. mill basis, without the allowance of carload freight, the OPA said today.

The United States Government on some purchases of newsprint paper for its agencies desires quotations on a strictly f.o.b. mill basis, without freight allowance. Under Revised Maximum Price Regulation No. 130 (Standard Newsprint Paper) there is no satisfactory way of quoting f.o.b. mill prices, the pricing procedure employed establishing ceilings f.o.b. mill with lowest carload rate of freight allowed to destination point, except in certain sales by a merchant from his warehouse stocks. Amendment No. 1, effective February 8, 1943, will enable sellers to quote the Government an f.o.b. mill price.

The desire of the government for f.o.b. mill quotations arises from the fact that, at the time bids are requested, the Government may not have determined the place where the paper is to be used, nor the quantities required for each destination. In those instances the seller may now determine the average price he received after allowing freight on all his sales and deliveries of standard newsprint paper during the calendar month prior to quoting such price, and this will be his f.o.b. mill ceiling.

Thomas McCabe Named to Committee

PHILADELPHIA, Pa., February 1, 1943—Thomas McCabe, president of Scott Paper Company, has been named a member of the U. S. National Committee of the Inter-American Development Commission, it was announced this past week.

Mr. McCabe is also president of the Governing Board of the Philadelphia Federal Reserve Bank.

The chairman of the committee is Eric A. Johnston, president of the Chamber of Commerce of the United States.

CONSTRUCTION NEWS

Under limitations order L-41 all projects involving expenditures of more than $5,000 must be specifically approved by the War Productions Board. The status of projects reported herewith under the provisions of the order is not known.—EDITOR.

Charleroi, Pa.—The Keystone Drum Company, Oliver Building, Pittsburgh, Pa., manufacturer of fiber drums and containers, has arranged for purchase of former plant of Charleroi Steel Foundry Company, Charleroi, comprising a large one-story building. Structure will be remodeled and improved for new branch plant, including construction of a one-story addition for increase in available floor area. Entire project is reported to cost close to $50,000, including equipment. General contract for modernization and extension has been awarded to Siesel Construction Company, 3528 Forbes street, Pittsburgh, and work is scheduled to be placed under wav at once.

Madison, Wis.—The United States Forest Products Laboratory, Madison, has completed plans for new addition for storage and distribution service. No estimate of cost announced. Structure, it is said, will be of temporary character. Bids have been asked on general erection contract and work will be placed in progress at early date.

Cleveland, Ohio—The Industrial Rayon Corporation, Walford avenue and 98th street, manufacturer of viscose rayon products, has completed plans for two new additions to mill, to be used for general expansion in production division. Erection contract has been awarded to George A. Rutherford Company, 2725 Prospect avenue, Cleveland. It is understood that a priority rating has been secured, with work to be placed in progress at once. Wilbur Watson and Associates, 4614 Prospect avenue, Cleveland, are architests and engineers.

Jacksonville, Fla.—The Consolidated Container Corporation, Jacksonville, recently organized, is said to have plans maturing for early operation of new local plant for manufacture of a line of corrugated boxes and containers. Principal incorporator and company representative is O. W. Collins, 1500 Avondale avenue, Jacksonville.

Wisconsin Rapids, Wis.—Consolidated Water Power and Paper Company, manufacturer of coated and other paper stocks, is awarding a number of miscellaneous contracts for materials for new mill addition, recently referred to in these columns, to be one and one-half story in height, about 83 x 100 feet, including structural steel to Wisconsin Bridge and Iron Company, Milwaukee; brick, to Gagnon Clay Products Company, Green Bay, Wis.; and roofing, to E. D. Chase Company, Oshkosh, Wis. Work has been placed under way by day labor. Structure will be located at the Ahdawagam Paper Products division mill at 800 Fremont street, and is reported to cost over $75,000, with equipment. Thomas Utegaard is company engineer, in charge.

Spartanburg, S. C.—The United Waste Company, Spartanburg, waste paper, etc., is considering early rebuilding of portion of storage and distributing plant, recently damaged by fire, with loss reported over $75,000, including building, equipment and stock.

Green Bay, Wis.—The Green Bay Box Company, 1406 South Broadway, manufacturer of paper boxes and containers, is awarding a number of miscellaneous contracts in connection with new addition recently referred to in these columns, including concrete blocks to William Van Ness Concrete Block Company; mixed concrete to Schuster Ready Mixed Concrete Company; and roofing, to Badger Sheet Metal Works, all of Green Bay. Foundation work has been started and work on superstructure will proceed at early date. The Selmer Company, Northern Building, Green Bay, is general contractor. Harry W. Williams, last noted address, is architect.

Lachine, Que.—Laminated Papers, Ltd., 941 Inspector street, Montreal, Que., manufacturer of special processed papers, has preliminary plans under way for new addition to plant at Lachine. It is understood that work will begin at early date.

Chandler, Que.—The Gaspesia Sulphite Company, Ltd., Quebec, Que, manufacturer of sulphite fiber, has approved plans for expansion and improvements in mill at Chandler.

Dalhousie, N. B.—The New Brunswick International Paper Company, Dalhousie, manufacturer of newsprint, wrapping paper stocks, etc., is considering plans for remodeling and improving portion of mill, to provide increased facilities and production efficiency. No estimate of cost has been announced.

New York, N. Y.—The Bee Folding Box Company, a new organization in city, has leased space in building at 30 East Twentieth street, and will occupy plant for manufacture of a line of folding paper boxes and other containers.

Chlorine Institute Elect Officers

The Chlorine Institute, Inc., at its annual meeting and Directors' Meetings held January 27 at the Chemists' Club, New York, N. Y., elected the following directors for two years: Thomas Coyle, E. I. duPont de Nemours & Co., Inc., Electrochemicals Department; W. I. Galliher, Pittsburgh Plate Glass Company, Columbia Chemical Division; L. Neuberg, Westvaco Chlorine Products Corporation; E. E. Routh, The Mathieson Alkali Works, Inc.; B. P. Steele, Pennsylvania Salt Manufacturing Company, and Eli Winkler, Southern Alkali Corporation.

The hold-over directors are: G. S. Cooper, Diamond Alkali Company; R. W. Hooker, Hooker Electrochemical Company; S. W. Jacobs, Niagara Alkali Company; E. C. Speiden, Isco Chemical Division of Innis, Speiden & Co., and I. H. Taylor, Wyandotte Chemical Company.

At a Directors' Meeting following the annual meeting, the officers shown below were elected for the year 1943: S. W. Jacobs, president; E. C. Speiden, vice president, and Robert T. Baldwin, secretary and treasurer.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending January 30, 1943

STOCKS

	High	Low	Last
A. P. W.	....	....	....
Armstrong Cork Co.	34¾	31½	34¾
Celotex Corp.	10	9⅜	9⅞
Celotex Corp., pf.	81½	80½	80½
Certain-Teed Products Corp.	4	3⅝	3⅞
Certain-Teed Products Corp., pf.	39½	37⅞	37½
Champion Paper & Fibre Co.	19	18⅝	18¾
Champion Paper & Fibre Co., pf.	100	99⅞	100
Congoleum Nairn Co.	18½	17⅞	18½
Container Corp. of America	18⅞	18	18⅞
Continental-Diamond Fibre Co.	9¾	7¾	9¾
Crown-Zellerbach Co.	12⅝	11⅞	12⅝
Crown-Zellerbach Co., pf.	86½	85	86½
Dixie-Vortex Co.	11⅝	10⅝	11⅝
Dixie-Vortex Co.—A.	39¾	39¼	39½
Flintkote Co.	16⅞	16¼	16¾
Robert Gair	2¼	2	2¼
Robert Gair, pf.	10¼	9¾	10
International Paper Co.	9⅞	9⅜	9⅝
International Paper Co., pf.	54¼	52⅞	53¾
Johns-Manville Corp.	72	71	71½
Johns-Manville Corp., pf.	127	126	127
Kimberly-Clark Corp.	27½	26¼	27½
MacAndrews & Forbes	22	22	22
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	33½	32¾	33½
Mead Corp.	7¼	7	7¼
Mead Corp., pf.—A. 6%	73	71¼	73
Mead Corp., pf.—B 5½%	62	62	62
Paraffine Companies, Inc.	37⅛	37⅛	37⅛
Paraffine Companies, Inc., pf.	102	102	102
Rayonier, Inc.	13	12⅜	12⅜
Rayonier, Inc., pf.	30	29½	29½
Ruberoid Co.	21¾	21⅛	21¼
Scott Paper Co.	42	39½	42
Scott Paper Co., pf.	113¾	113½	113½
Sutherland Paper Co.	27⅝	27⅛	27⅛
Union Bag & Paper Corp.	9¼	9	9¼
United Paperboard Co.	3¾	3⅜	3¾
U. S. Gypsum Co.	62	59	59¾
U. S. Gypsum Co., pf.	175	173	175
West Virginia Pulp & Paper Co.	14	13⅝	13⅝

BONDS

Abitibi Pulp & Paper Co. 5s '53	....	....	....
Celotex Corp. 4½s '47	100⅞	100¼	100⅞
Certain-Teed Products Corp. 5½s '48	96	95	96
Champion Paper & Fibre Co. 4¾s '50	....	....	....
International Paper Co. 6s '55	105½	105¼	105¾
International Paper Co. 5s '47	104	103½	104
Mead Corp. 3¼s '55	....	....	....
West Virginia Pulp & Paper Co. 3s '54	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending January 30, 1943

STOCKS

	High	Low	Last
American Box Board Co.	4¾	4¼	4¼
Brown Co., pf.	....	....	....
Great Northern Paper Co.	31	30½	30½
Hummel-Ross Fibre Corp.	3⅜	3¼	3¾
National Container Corp.	10	9¾	10
St. Regis Paper Co.	2¼	1¾	2¼
St. Regis Paper Co., pf.	122	118	122
Taggart Corp.	4	3¾	4

BONDS

American Writing Paper Co. 6s '61	91	90⅛	90½

Sutherland Nets $2.57

The Sutherland Paper Company for 1942 reports net profit, after $1,415,174 provision for Federal income and excess profits taxes after post-war credit, was $737,917, equal to $2.57 a share, against $818,055, or $2.85 a share for 1941, after $756,352 Federal tax deduction.

Container Corp. Votes Dividend

Meeting in Philadelphia on January 21, the board of directors of the Container Corporation of America declared a dividend of 25 cents per share payable February 20, 1943, to stockholders of record February 5, 1943.

Whitaker Co. Earns $5.42

At the annual meeting of the Whitaker Paper Co., Sixth and Lock street, Cincinnati, Ohio, it was announced that net earnings after taxes for 1942 amounted to $217,638, as against $381,937 in 1941. Also announced were earnings of $5.42 a share on common stock, as against $9.18 in 1941.

Directors declared the regular quarterly dividend of $1.75 on their preferred stock, payable April 1, 1943, to stockholders of record at close of business March 20, 1943. A dividend also was declared of $1 a share on common stock, payable April 1, 1943, to stockholders of record at close of business March 20, 1943.

Expects Higher Celotex Sales

Bror Dahlberg, president of Celotex Corporation, said at the annual meeting of stockholders that 1943 sales will be far in excess of the $23,500,000 sales volume for 1942, and that the stockholders "are going to be very well pleased when figures are soon released."

The Certain-teed Corporation is improving very rapidly and is paying up its debts, he said. The increase in Celotex Corporation sales, he added, will be due to new products the company has introduced.

Paraffine Co. Profits Up

The Paraffine Companies, Inc., and subsidiaries, for the three months ended December 31, 1942, report a net income of $419,211 after taxes and charges, equal after preferred dividends to 83 cents a share on 476,062 common shares; preceding period $385,380 and 76 cents a share; year ago $608,116 and $1.23 a share; six months' net income $830,480 after taxes and charges, equal after preferred dividends to $1.64 a share; year ago $1,102,727 and $2.22 a share.

Black-Clawson Nets $3.89

The Black-Clawson Company for the year to September 30, reports a net income after $611,731 Federal taxes was $463,430, or $3.89 each on 112,270 common shares after preferred dividend requirements. Net income for previous year after $335,543 taxes was $611,080, or $5.20 each on 112,420 common shares. Net sales in last year totaled $6,184,110, against $5,527,971 the year before.

Crystal Tissue Co. Elects Officers

At the annual meeting of stockholders of The Crystal Tissue Company, Middletown, Ohio, on January 26, the following officers were re-elected: president, E. E. Grant; vice-president and general manager, L. J. Long; secretary and treasurer, E. A. Cahill; vice-president in charge of manufacture, H. H. Harrison; vice-president in charge of sales, John J. Cahill; assistant sales manager, W. E. Piper.

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Henry J. Berger

EDITOR

Vol. 116 February 4, 1943 No. 5

COMING EVENTS IN PAPER INDUSTRY

American Paper and Pulp Association, Sixty-sixth Annual Convention and meeting, Waldorf-Astoria Hotel, New York, February 15-19.

Technical Association of the Pulp and Paper Industry, Convention, Commodore Hotel, New York, February 15-18.

National Paper Trade Association of the United States, Convention, Waldorf-Astoria Hotel, New York, February 15-18.

Salesmen's Association of the Paper Industry, Annual Meeting and Luncheon, Waldorf-Astoria Hotel, New York, Tuesday, February 16.

The New York Association Of Dealers In Paper Mills' Supplies, Annual Banquet, Commodore Hotel, New York, Tuesday, February 16.

Paper Club of New York, Annual Dinner and Entertainment, Waldorf-Astoria Hotel, New York, Wednesday, February 17.

Canadian Pulp and Paper Association, Thirteenth Annual Meeting, Mount Royal Hotel, Montreal, Que., Canada, January 27, 28 and 29.

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

American Pulp and Paper Mill Superintendents Association, Twenty-fourth Annual Convention, Commodore Hotel, New York, June 15-17.

MANPOWER A PROBLEM

Manpower is now recognized as the nation's number one problem. In no other basic resource is it so difficult to effect the most rapid and efficient expansion of the production the war demands. Goods for the fighting fronts and for the home front are alike essential and the proper distribution of manpower is so vital to both that the progress of the war effort and the continued operation of private industry is dependent upon the practical solution of the manpower problem. It is conceded by some who are in a position to speak with authority, that the effect of this lack of balance or inefficiency in the distribution of workers has created and continues to retard production, not only of military goods but of food stuffs. As not enough persons with the necessary skills are now available to most efficiently perform the tasks required in plans for increased production, the problem cannot be solved at once. If skilled men are not now available they must be trained. Only a part of our full productive capacity is now utilized. This is due in large part, it has been pointed out, not to machines but for lack of men to build machines and to operate them. Delay in starting this training has and continues to be a primary bottleneck. It seems clear that the manpower problem was not recognized as a major factor and not enough is being accomplished today to clear the way for the greatly expanded industrial output which looms as a crucial factor in bringing the war to a victorious conclusion. In fact, any vigorous attempt to solve the manpower distribution problem is only now taking effective shape.

It is to be hoped that the formidable problem of manpower stabilization can be met without the use of compulsory methods, states the Guaranty Trust Company of New York in discussing how serious the manpower situation is, in the current issue of *The Guaranty Survey*. "The country appears, however, to be facing a period of increasing over-all shortages; and it is only by successive adaptations to changing needs and conditions that the growing requirements can be supplied without severe disturbances to essential industries", *The Survey* continues. "The task is difficult but not impossible, and if it is carried out with skill and vigor the United States will find itself in a much more favorable position than its enemies as far as manpower is concerned. The United States, with about 7,000,000 men now in the armed forces and 17,500,000 in war industries, and with 6,000,000 more to be added to these two groups this year, faces a manpower problem which, while vastly less difficult than that of our enemies, will tax both the capacity and the flexibility of our labor supply. Conscription will remain for some time a major influence on the general labor situation, and hardly less important in the aggregate will be the growing requirements of war industries. Local Selective Service Boards have been advised that it will be necessary to increase the drafting of essential workers, and official statements indicate that all able-bodied men of military age must expect eventually to be called into the armed forces. This means that the vast job of war production and indispensable output for civilian use must be taken over and carried on in its entirety by those unsuitable for service on the fighting fronts."

In commenting on the complexity of the problem *The Survey* states in part that, "It is admittedly difficult to arrive at even approximate judgments at a time when conditions and requirements are changing so rapidly as at present and when actual knowledge concerning manpower resources is so imperfect. Recent official estimates place the nation's total manpower needs at the end of 1943 at 65,000,000, as against approximately 59,000,000 employed at present. The number unemployed is estimated at 1,900,000, of whom about half represent an irreducible minimum of unemployment. These figures would indicate that about 5,000,000 additional persons not ordinarily constituting a part of the labor force must be drawn into it this year. The majority of these industrial recruits will be women. It is officially estimated that by the end of this year women will hold 30% of the jobs in war industries and 45% of the jobs in other industries, exclusive of agriculture. . . . About 3,000,000

men will probably be added to the armed forces during the year; a large proportion of these will be drawn from essential industries and will have to be replaced. War industries will require perhaps 2,500,000 more workers than they now employ. The shift of employees from non-essential into essential jobs, the rehabilitation and reemployment of workers now unemployed, and the addition of women and others to the labor force will involve a tremendous task of training and readjustment."

In suggesting a practical means for increasing production *The Survey* points out that, "It is clear that a general lengthening of working hours sufficient to raise the average of all industry to forty-eight hours weekly would be equivalent to an addition of several million persons to the labor force."

Canadians to Help Cut Lumber

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 1, 1943—According to the Minister of Labor for Canada, a limited number of men have been permitted to cross the border into the United States to engage in logging operations, during the present winter.

He said it was arranged between the governments of the United States and Canada that this year approximately 3,700 would be allowed to cross to the United States for this purpose.

The statement made these points:

"1. Not only were logging operators in the United States interested in this movement, but the war manpower board of the United States also was keenly interested;

"2. The allocation of the 3,700 men among the various operators was wholly undertaken by agencies of the U. S. government;

"3. Quite a proportion of the logs cut in the New England states are for export to, and processing in Canada, and enter into Canadian manufactures."

The Labor Minister said that in October it was discovered that the numbers of Canadians then in the United States for logging work fell well below the quota of 3,700.

He disclosed that late in 1942 the War Manpower Board at Washington urged that 2,250 additional men be authorized to cross the border. It was finally agreed to allow 500 additional men to enter the United States, with the assignment of this number among the different firms to be carried out by the War Manpower Board.

Introduces Pollution Bill

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 3, 1943—A joint resolution, H. J. Res. 68, to prevent pollution of streams by pulp and paper manufacturers has been introduced in the House by Rep. Weiss, of Pennsylvania, and referred to the Committee on Ways and Means.

The bill provides "That all Federal departments, agencies, and establishments are hereby prohibited from purchasing any pulp or paper manufactured by any person, firm, partnership, or corporation which permits the pollution of any stream in the process of manufacturing."

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1942		Corresponding Weeks—1941	
December 19	88.0	December 20	107.3
Dec. 26....Holiday Week	62.3	December 27	79.3
January 2, '43	73.6	January 3, '42	102.2
January 9	86.8	January 10	103.5
January 16	88.0	January 17	105.0
January 23	*88.0*	January 24	105.0

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1941	85.6	89.7	92.2	96.0	98.7	99.3	94.2
1942	104.5	103.9	102.9	100.4	95.3	87.4	75.8

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1941	101.0	99.7	105.2	106.2	100.4	97.4
1942	80.8	82.8	90.7	86.8	*80.1*	*90.5*

COMPARATIVE YEARLY SUMMARIES

	1935	1936	1937	1938	1939	1940	1941	1942
Year Average.	69.9	80.4	79.8	71.5	83.4	85.6	97.4	*90.5*

* Based on tonnage reported to Amercian Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS †

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1937	83	89	89	91	88	80	69	77	72	70	57	47	75
1938	56	63	63	60	60	59	59	60	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	82	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	81	82	77	*84*

Week ending Dec. 19, 1942—85 Week ending Jan. 9, 1943—82
Week ending Dec. 26, 1942—72 Week ending Jan. 16, 1943—88
Week ending Jan. 2, 1943—62 Week ending Jan. 23, 1943—*88*

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

Pharmaceutical Trade to Save Paper

WASHINGTON, D. C., Jan. 27, 1943—Recommendations for saving paper and paper board were made by the Pharmaceutical Manufacturers Industry Advisory Committee at a meeting in Washington. After hearing reports from a sub-committee on conservation of packaging materials, the members urged consideration of increasing the number of units in carrier cartons as well as the number of carrier cartons or packers in a shipping case.

While pointing out that drug manufacturers generally re-use shipping cases for bottles received from the bottle producers, they suggested that the entire industry follow this practice. They also urged the full re-use of shipping containers by wholesalers.

The committee also recommended discontinuing the custom of wrapping bottles by pharmaceutical manufacturers. It was suggested that where protection is needed for labels, a band or "sleeve" be used instead of wrapping the entire bottle, or that some protective coating be used on the label. Transparent wrappings for bottles are becoming critical.

Recommendations will be made by the committee at a later meeting on the caliber of paper board to be used in different size paper cartons, and also on set-up boxes used for vitamins and other products.

R. E. Morriss Elected Vice President

Thomas E. Morriss, who on December 1, 1942 completed his assignment with the Pulp and Paper Division of the War Production Board, has been elected vice president of the Central Fibre Products Company in charge of boxboard sales and has assumed his duties as of January 1 at the company's offices, 111 West Washington street, Chicago.

1943 EDITION

LOCKWOOD'S DIRECTORY

OF THE PAPER AND ALLIED TRADES

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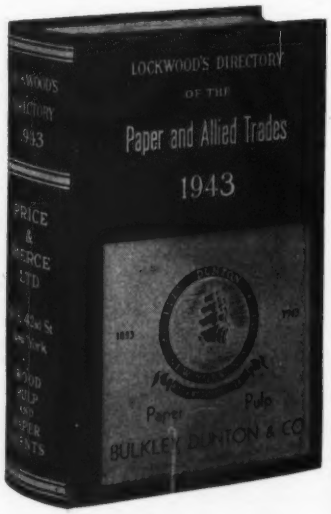

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Section of the

TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY

Edited by R. G. Macdonald, Secretary

United States Patents on Papermaking

Fourth Quarter, 1942

Compiled by Clarence J. West, Chairman, Committee on Abstracts and Bibliography; TAPPI

The following list of patents has been compiled from the current numbers of the Official Gazette of the United States Patent Office. Because, as a rule, only one claim is published in the Gazette, it is not claimed that the list is complete; also, it is possible that the list may contain some patents which do not apply to pulp and paper manufacture.

Copies of any of the following patents may be obtained from the U. S. Patent Office, Washington, D. C., by sending ten cents for each patent desired. The number, name of the inventor, and the title of the patent should be given in the request. Personal checks and postage stamps are not accepted in payment for patents. Books of coupons may be purchased for two or ten dollars, good for 20 or 100 patents. Coupon orders do not have to be accompanied by letters of transmittal.

October 6, 1942

2,297,685. Method of preparing vegetable proteins. John C. Brier and Gerard W. Mulder, assignors to Welsh and Green, Incorporated, Chicago, Ill. Filed March 13, 1939. 3 claims. (Cl. 260-112). A process of isolating the protein of oleaginous seed material, in which the water used in all operations is approximately at the isoelectric point of the protein isolated.

2,297,698. Treating bibulous paper. Richard D. Freeman, assignor to The Dow Chemical Company, Midland, Mich. Filed July 20, 1940. 7 claims. (Cl. 117-103). High wet strength is obtained in a bibulous paper base with a solution, the solute comprising from 5-40 parts of a water-soluble cellulose ether, from 50-95 parts of an ureaformaldehyde resin modified with from 50-100 parts of a polyhydric alcohol, drying and heating the paper to 90-120 deg. C.

2,297,709. Hot-melt coating composition comprising cellulose ethers. Toivo A. Kauppi and Earle L. Kropscott, assignors to The Dow Chemical Company, Midland, Mich. Filed May 16, 1939. 3 claims. (Cl. 106-173). A hot-melt coating composition adapted to form non-blocking coatings comprises 5-20 parts of ethylcellulose (47-49% ethoxyl, viscosity below 40 cp.), 25-55 parts of hydrogenated castor oil (m. p. above 50 deg. C.), 15-40 parts of compatible resin (rosin, ester gum, gum dammar, nonsetting alkyd type resins, oil-soluble phenol-formaldehyde resins), and 15-30 parts mineral wax (m. p. above 40 deg. C.).

2,297,946. Carton liner for molded edibles and method of folding. Charles Doering, assignor of one-half to Henry H. Doering, Chicago, Ill. Filed Oct. 23, 1939. 10 claims. (Cl. 93-36.01). A carton liner comprises a rectangular sheet of material folded upon itself to provide a creased bottom line and joined by sealing at its side edges.

2,297,990. Testing of greaseproof paper. Milton G. Schmitt and Martin L. Downs, assignors to Thilmany Pulp & Paper Company, Kaukauna, Wisconsin. Filed Jan. 14, 1942. 3 claims. (Cl. 73-51). One side of a test sample is coated with a pigment and the other side with a liquid which is miscible with oil and of such character that when the coating is impregnated with the liquid, the appearance of the impregnated coating will contrast with the appearance of the coating which has not been so impregnated.

2,298,004. Container manufacture. Harry C. Fisher and Walter E. Sooy, assignors to Continental Can Company, Inc., New York, N. Y. Filed Feb. 16, 1940. 14 claims. (Cl. 93-81). A process for forming tubular bodies for containers.

2,298,078. Plastic masses similar to factice and linoxyn. Werner Wolff, assignor to General Aniline & Film Corporation, New York, N. Y. Filed Aug. 5, 1939. 5 claims. (Cl. 260-23). Plastic masses consist of interpolymerization products of at least a vinyl ether having a plurality of vinyl groups in the molecule and of esters of saturated alcohols with tall oil.

2,298,173. Container producing machine. Harold E. Rue, assignor to Pabst Brewing Company, Chicago, Ill. Filed May 8, 1941. 6 claims. (Cl. 93-81). A rotated mandrel for receiving a fibrous web and winding the same to provide a plurality of layers.

October 13, 1942

2,298,289. Coating machine. James H. Gordon, Jr., assignor to American Can Company, New York, N. Y. Filed Aug. 27, 1940. 7 claims. (Cl. 91-46). A machine for coating fiber containers.

2,298,326. Vibration and sound damping material. Erwin A. Worm, Jr., assignor to Armstrong Cork Company, Lancaster, Pa. Filed Jan. 31, 1939. 5 claims. (Cl. 154-44). A felted, fibrous waterlaid web having impregnating medium disposed within the body thereof but not completely saturating the same.

2,298,391. Wad forming machine. Arthur J. Lewis, assignor to Remington Arms Company, Inc., Bridgeport, Conn. Filed Aug. 25, 1939. 4 claims. (Cl. 92-59). A machine for making gun wads from a slurry of wad-forming materials.

2,298,522. Method of manufacturing bags. Harry F. Waters, New York, N. Y. Filed Oct. 3, 1940. 3 claims. (Cl. 93-35). Method of forming a seam incident to the making of a bag from flexible sheet material.

2,298,531. Creped wadding re-expanders. Charles A. Fourness and Rudolf A. Moravek, assignors to Paper Patents Company, Neenah, Wis. Filed March 30, 1939. 4 claims. (Cl. 154-1). Apparatus for re-expanding a roll of previously endwise compressed creped wadding.

2,298,548. Solution of zein in solvents acidified with inorganic acids. Roy E. Coleman, assignor to Time, Incorporated, New York, N. Y. Filed July 18, 1938. 14 claims. (Cl. 106-153). A coating composition comprises a solution of zein in alcohol and an inorganic acid.

2,298,549. Treating zein. Roy E. Coleman, assignor to Time, Incorporated, New York, N. Y. Filed Feb. 20, 1939. 8 claims. (Cl. 106-153). A dry, nonplastic nonsticky composition of zein and an inorganic acid is used as a coating composition.

2,298,592. Decorative product. William Wallace Rowe, assignor to Cincinnati Industries, Inc., Cincinnati, Ohio. Filed Feb. 8, 1937. 2 claims. (Cl. 154-47). A product suitable as artificial leather, flooring, wall covering, etc.

2,298,876. Stabilized dry rosin size. Arthur C. Dreshfield, assignor to Hercules Powder Company, Wilmington, Del. Filed Dec. 4, 1940. 7 claims. (Cl. 106-218). A saponified rosin and an antioxidant therefor.

2,298,943. Process of reclaiming wax from waste waxed paper. Perlie E. Howard, Nashua, N. H. Filed May 15, 1939. 2 claims. (Cl. 196-17). A solution of two ounces of sodium bicarbonate in one gallon of water is used per half pound of paper at a temperature not exceeding 205 deg. F.

2,298,994. Manufacture of papermaking fiber. Sidney D. Wells, assignor to The Institute of Paper Chemistry, Appleton, Wis. Filed June 25, 1941. 2 claims. (Cl. 19-5). A method of treating flax straw.

2,299,026. Method of and apparatus for coating paper. Carle J. Merrill, Portland, Maine. Filed Feb. 23, 1938. 6 claims. (Cl. 91-45). A method of applying semiliquid coating material to a travelling web.

October 20, 1942

2,299,066. Method of making molded inlaid linoleum. John L. Berger, assignor to Armstrong Cork Company, Lancaster, Pa. Filed Aug. 3, 1940. 12 claims. (Cl. 154-26).

2,299,098. Method of and apparatus for making collapsible boxes. Harold S. Labombarde, assignor to The International Paper Box Machine Company, Nashua, N. H. Filed July 22, 1940. 13 claims. (Cl. 93-49).

2,299,132. Manufacture of cellulose. Henry Dreyfus, assignor to Celanese Corporation of America, New York, N. Y. Filed Dec. 29, 1938. 12 claims. (Cl. 92-9). A method of digesting lignin-containing cellulosic materials with nitric acid.

2,299,144. Fusible coating composition. Clark C. Heritage and Henry E. Walter, assignors to Wood Conversion Company, Cloquet, Minn. Filed May 22, 1939. 4 claims. (Cl. 106-273). A coating consists of 10-15% asphalt, 60-75% glisonite, 10-30% montan wax, and 0-8% paraffin wax.

2,299,169. Process of making extended pigment with improved tinting strength. Kenneth S. Mowlds, assignor to The Glidden Company, Cleveland, Ohio. Filed Aug. 2, 1940. 2 claims. (Cl. 106-294). The pigment consists of a precipitate of barium sulphate and zinc sulphide.

2,299,170. Process of making composite pigments. Kenneth S. Mowlds, assignor to The Glidden Company, Cleveland, Ohio. Filed Aug. 2, 1940. 18 claims. (Cl. 106-294). The pigment consists of barium sulphide and the sulphate of another metal, forming lithopone and its variations.

2,299,200. Treatment of cellulosic fabrics. Pierrepont Adams, assignor to American Cyanamid Ccompany, New York, N. Y. Filed Oct. 10, 1940. 11 claims. (Cl. 8-118). Cellulose fabrics are treated with strong sulphuric acid of parchmentizing strength containing an aminotriazine (melamine).

2,299,248. Log chipper. Peter N. Ottersland, Watertown, N. Y. Filed Jan. 13, 1940. 3 claims. (Cl. 144-176).

2,299,306. Paraffin wax composition and method of producing same. Mead Cornell, assignor to The Cornell Machine Company, Cleveland, Ohio. Filed Aug. 12, 1938. 11 claims. (Cl. 106-271). In improving the properties of paraffin wax as a coating agent for paper, it is homogenized with 0.1-10% of a petroleum wax and about 0.1-10% of an aromatic amide of a fatty acid.

2,299,312. Stabilized dry rosin size. Arthur C. Dreshfield, assignor to Hercules Powder Company, Wilmington, Del. Filed Dec. 4, 1940. 8 claims. (Cl. 106-218). An antioxidant for a stabilized dry size (rosin) composition is claimed.

2,299,459. Paper manufacture. Henri G. Chatain, assignor to Hammermill Paper Company, Erie, Pa. Filed March 15, 1940. 14 claims. (Cl. 34-41). In drying paper, a method is proposed to prevent substantial escape of air from the zone intermediate the rolls and thus maintain in contact with the paper a substantially isolated mass of humid air to prevent substantial drying in this zone.

2,299,460. Paper manufacture. Henri G. Chatain and Herbert L. Dyer, Jr., assignors to Hammermill Paper Company, Erie, Pa. Filed March 16, 1940. 8 claims. (Cl. 34-18). A method of passing paper over a series of drier rolls, in which one side of the sheet is pressed against the surface of the drier roll by contacting the other side with a flexible band, etc.

2,299,530. Siphon for drier drainage system. Hervey G. Cram, Appleton, Wis. Filed Dec. 9, 1940. 1 claim. (Cl. 285-10).

2,299,612. Fire resistant composition and

fabric. Edwin C. Clayton and Lawrence L. Heffner, assignors to Wm. E. Hooper & Sons Company, Woodberry, Baltimore, Md. Filed Aug. 14, 1941. 13 claims. (Cl. 106-15). The fireproofing material consists of a chlorinated paraffin, chlorinated paraffin oil, chlorinated fish oil, chlorinated vegetable oils, chlorinated rubber, etc., with a metallic compound such as antimony oxide, arsenic sulphide, etc.

2,299,626. Paper roll and mounting therefor. William V. Hunt, Vancouver, British Columbia, Canada. Filed Aug. 16, 1939. 2 claims. (Cl. 242-68). An apparatus for winding paper onto a roll.

2,299,662. Drying drum for the drying of felts. Wilhelm Thaler, assignor to American Voith Contact Co., Inc., New York, N. Y. Filed March 13, 1940. 3 claims. (Cl. 34-111). A drum having a plurality of grooves on the periphery formed by imperforate walls, with means for air suction and air compression.

2,299,693. Coating for paper. Barrett K. Green, assignor to The National Cash Register Company, Dayton, Ohio. Filed Feb. 23, 1940. 19 claims. (Cl. 106-236). The coating consists of gum dammar in toluene with a plasticizer and containing glycerin, ferric ammonium sulphate, gallic acid and water.

2,299,694. Manifolding material. Barrett K. Green, assignor to The National Cash Register Company, Dayton, Ohio. Filed March 9, 1940. 19 claims. (Cl. 106-236). A solution of gum dammar in toluene contains glycerin, polyethylene glycol and carbon black or other pigment.

October 27, 1942

2,299,746. Fourdrinier machine. Harry H. Hart, assignor to The Pusey and Jones Corporation, Wilmington, Del. Filed Oct. 12, 1939. 21 claims. (Cl. 92-44). Means to permit rapid replacement of the endless wire forming screens used on relatively wide Fourdrinier machines.

2,299,805. Packing. Harry B. Denman, assignor to Detroit Gasket & Manufacturing Company, Detroit, Mich. Filed Dec. 26, 1941. 1 claim. (Cl. 288-34). A flexible packing consists of a laminated paperboard.

2,299,983. Cotton fiber measuring instrument. Kenneth L. Hertel, assignor to University of Tennessee Research Corporation, Knoxville, Tenn. Filed Dec. 21, 1939. 28 claims. (Cl. 234-1.5). A method of moving fibers through light which is projected onto a light-responsive device.

2,299,991. Chart paper. Wilmer F. Kallock, assignor to McLaurin-Jones Co., Brookfield, Mass. Filed Jan. 18, 1941. 7 claims. (Cl. 234-74). A dark surfaced foundation paper with a relatively soft, stylue-pressure-sensitive, blushed light-colored lacquer film.

2,300,078. Controlling means for adhesive applying apparatus. George W. von Hofe, assignor to New Jersey Machine Corporation, Hoboken, N. J. Filed June 3, 1941. 5 claims. (Cl. 216-55).

2,300,107. Apparatus and method of testing surfaces. Joseph G. Curado and Richard A. Denton, assignors to General Printing Ink Corporation, New York, N. Y. Filed Aug. 4, 1941. 12 claims. (Cl. 73-51). Method of testing the scratching or marring resistance of printed surfaces by subjecting it to the action of a blunt non-heat-conducting testing member at a predetermined speed and pressure.

2,300,137. Fire resistant wallboard. Arthur C. Salisbury, assignor to Fir-Tex Insulating Board Co., St. Helens, Oreg. Filed March 27, 1940. 2 claims. (Cl. 92-21). The board contains an expanded vermiculite with particle sizes between 6- and 20-mesh.

2,300,168. Moistureproof material. Arloe R. Olsen, assignor to Hercules Powder Company, Wilmington, Del. Filed Sept. 12, 1939. 4 claims. (Cl. 117-146). A cellulosic sheet is coated with a chlorinated rubber containing in excess of 50% of chlorine and a non-waxy chlorinated polycyclic hydrocarbon adapted to plasticize the rubber. This coating decreases the moisture vapor permeability between 93 and 97%.

2,300,177. Apparatus for operating on web and sheet materials. Robert L. Richmond, assignor to Potdevin Machine Company, Brooklyn, N. Y. Filed Sept. 26, 1941. 9 claims. (Cl. 164-64). Apparatus for notching material.

2,300,184. Method and apparatus for producing pulp. Edward T. Turner, Dayton, Ohio. Filed Nov. 16, 1938. 5 claims. (Cl. 92-7). A continuous pulping process with means for maintaining the material under high pressure at the desired temperature during the cooking operation.

2,300,373. Coated paper. Frank R. Stoner, Jr., and Daniel M. Gray, assignor to Stoner-Mudge, Inc., Pittsburgh, Pa. Filed March 11, 1942. 8 claims. (Cl. 117-143). Paper is coated with a finishing varnish consisting of a copolymer of a vinyl halide and a vinyl ester and a copolymer of a vinyl halide, a vinyl ester and a a member of the group consisting of maleic acid, etc.; the product is resistant to oils, greases, etc.

November 3, 1942

2,300,553. Method of and apparatus for valving bags. Harry E. Lee and Frank M. Holter, assignors to St. Regis Paper Company, New York, N. Y. Filed Sept. 7, 1939. 13 claims. (Cl. 93-8).

2,300,587. Adhesive. Adolf Menger, assignor to General Aniline & Film Corporation, New York, N. Y. Filed Jan. 31, 1939. 7 claims. (Cl. 260-32). An adhesive consists of a partially depolymerized chlorinated polyvinyl chloride and a polyvinyl ether.

2,300,610. Barking drum. Burl Branch, North Bay, Ontario, Canada. Filed Nov. 17, 1941. 10 claims. (Cl. 144-208).

2,300,695. Sample holder for spectrophotometers and colorimeters and method of comparing optical reflecting powers of materials. Robert H. Park, assignor to American Cyanamid Company, New York, N. Y. Filed Nov. 7, 1939. 8 claims. (Cl. 88-14).

2,300,713. Paper box machine. Edwin G. Staude, assignor to E. G. Staude Manufacturing Company, St. Paul, Minn. Filed May 19, 1941. 6 claims. (Cl. 93-50).

2,300,733. Cellulose pulping system. Lyle Melvin Sheldon, assignor to The Cellulose Research Corporation, East Alton, Ill. Filed May 21, 1937. 2 claims. (Cl. 92-11). A method for pulping highly resinous wood (southern pine) by the sulphite process, the temperature being raised to 120 deg. C. in 3 hours, held at 121-123 deg. C. for 3 hours, raised to 130 deg. C. during 1 hour and held at that point for 2 hours; the pulp is then bleached with chlorine-hypochlorite.

2,300,827. Flotation of nonmetallic minerals. Ludwig Jacob Christmann and Stephen Edward Erickson, assignors to American Cyanamid Company, New York, N. Y. Filed July 23, 1940. 7 claims. (Cl. 209-166). In recovering phosphate ores flotation is carried out in the presence of a tall oil phosphate diluted with an aliphatic water-soluble ketone.

2,300,906. Method and apparatus for making fibrous containers. Frederick L. Bronson, assignor to The Fibre Can Machinery Company, New Haven, Conn. Filed Oct. 11, 1939. 35 claims. (Cl. 93-81).

2,300,907. Adhesive. Frederick L. Bronson, assignor to The Fibre Can and Machinery Company, New Haven, Conn. Filed Nov. 7, 1939. 6 claims. (Cl. 106-240). Casein, triethanolamine, urea and glycerin are used for a flexible adhesive.

2,300,908. Reciprocating doctor for papermaking and allied machines. Arthur E. Broughton, Glens Falls, N. Y. Filed May 24, 1939. 1 claim. (Cl. 92-74). A stationary doctor for rolls extending across the width of the roll and carrying a light-weight doctor blade, the blade carrier being mounted and guided in the supporting structure for reciprocation.

2,300,909. Reciprocating shower, Arthur E. Broughton, Glens Falls, N. Y. Filed Jan. 29, 1940. 3 calims. (Cl. 299-55).

2,300,994. Calender for paper. William F. Thiele and Bert F. Raprager, assignors to Consolidated Water Power & Paper Company, Wisconsin Rapids, Wis. Filed Aug. 9, 1938. 4 claims. (Cl. 92-73). Means for separating all the rolls of the calender stack during the initial threading operation of the web of paper and means for driving each roll while they are in the separated relation.

2,301,016. Machine for wrapping rolls of toilet paper and the like. William H. Cannard, Green Bay, Wis. Filed Dec. 12, 1940. 5 claims. (Cl. 93-7).

2,301,048. Oil proofing. John H. Holton, Ronald B. Wilson, and Lee E. Kleinmaier, assignors to Pulp Products Company, Inc., New York, N. Y. Filed Dec. 9, 1938. 14 claims. (Cl. 106-126). An oil-resistant film is formed from 100 parts of sugar sirup, 15-30 parts of comminuted thickener (graphite, mica, or aluminum) and 2-10 parts of a setting agent (glue, starch, gelatin, flour, or gluten).

2,301,067. Automatic laminating machine. Harry W. Morgan, assignor to The Canister Company, Phillipsburg, N. J. Filed May 29, 1940. 41 claims. (Cl. 93-81). A machine for making laminated inner-liner fibrous tubes.

November 10, 1942

2,301,201. Method of and apparatus for classifying fibers. Merle P. Chaplin, assignor to Chaplin Corporation, South Portland, Maine. Filed Feb. 2, 1937. 22 claims. (Cl. 92-29).

2,301,215. Waterproofed material. Henry C. Koch, assignor to Abbott Coburn, Chicago, Ill. Filed Feb. 15, 1941. 6 claims. (Cl. 20-5). One face of a board or the like is impregnated with a waterproofing material to a greater depth than the other.

2,301,252. Stabilized rosin size composition. Jack T. Cassaday, assignor to American Cyanamid Company, New York, N. Y. Filed Dec. 28, 1940. 3 claims. (Cl. 106-218). A dry wood rosin size is stabilized against oxidation by incorporating 0.2-3% of methylaniline.

2,301,293. Machine for coating can bodies. Alfred L. Kronquest, assignor to Continental Can Company, Inc., New York, N. Y. Filed Jan. 25, 1940. 13 claims. (Cl. 91-18).

2,301,298. Rosin size composition and method of preparing same. Donald W. Light and Russell L. Morgan, assignors to American Cyanamid Company, New York, N. Y. Filed Nov. 28, 1940. 14 claims. (Cl. 106-144). An oil-in-water type of emulsion containing 65-95% total solids, the external phase consisting of rosin and rosin soap and the internal phase of a protein solution.

2,301,314. Process of making alpha cellulose. Ralph E. Montonna and Lew W. Cornell, assignor to Board of Regents of the University of Minnesota, Minneapolis, Minn. Filed Feb. 16, 1935. 16 claims. (Cl. 92-9). Hardwoods are treated with nitric acid (5% or less strength) for 24-30 hours. at 60-80 deg. C., steamed for 45 minutes, cooked for 2 hours with 2% sodium hydroxide and then bleached with chlorine-hypochloride.

2,301,329. Composition of matter. Lyle W. Rothenberger, assignor to Hercules Powder Company, Wilmington, Del. Filed Oct. 16, 1940. 11 claims. (Cl. 106-218). An antioxidant for rosin and rosin derivatives consists of a terpene ether.

2,301,452. Pulp composition and paper. Joseph E. Plumstead, assignor to West Virginia Pulp & Paper Company, New York, N. Y. Filed June 29, 1940. 9 claims. (Cl. 92-21). Mechanical wood pulp is treated with calcium or magnesium sulphite as an age-deterrent filler.

2,301,514. Screen plate. Grover C. Brewster, Shelton, Wash. Filed Oct. 5, 1939. 1 claim. (Cl. 92-30). A unitary metallic screen plate of uniform thickness and having integral structural parts fashioned from the thickness of the plate and embodying a plurality of parallel bars.

2,301,538. Sound insulating construction. Roynolds Guyer and Henry E. Hartig, assignors to Waldorf Paper Products Company, St. Paul, Minn. Filed June 4, 1938. 11 claims. (Cl. 154-45). A method of manufacturing corrugated board for a sound absorbing panel.

2,301,580. Leakproof container. Jack Press, Detroit, Mich. Filed Dec. 14, 1939. 2 claims. (Cl. 93-94). A method of coating a liner with a leakproofing material.

2,301,619. Doctoring mechanism. Willis G. Davis, Pompton Plains, N. J., assignor to Ascote, Inc. Filed April 16, 1941. 12 claims. (Cl. 91-29).

2,301,695. Manufacture of corrugated board. Joseph Louis Gillian, assignor to Corn Products Refining Company, New York, N. Y. Filed Oct. 25, 1939. 4 claims. (Cl. 154-32). An apparatus for pasting a liner to a corrugated sheet.

2,301,771. Art of producing receptacles. Clyde K. Billeb, assignor to Milprint, Inc., Milwaukee, Wis. Filed June 10, 1940. 5 claims. (Cl. 93-20).

2,301,830. Apparatus for disintegrating fibrous materials. John James Albert Talbot, Ilford, England. Filed July 18, 1940. 3 claims. (Cl. 83-93). A disintegrating and shredder mill, etc.

November 17, 1942

2,301,959. Moistureproof sheet wrapping material. Daniel D. Lanning, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Sept. 10, 1940. 15 claims. (Cl. 117-145). An incompletely polymerized dimethylol urea ether is incorporated in a moistureproofing coating composition.

2,301,986. Plastic acoustic pulp. Mario Valdastri, Honolulu, Territory of Hawaii. Filed Feb. 16, 1940. 1 claim. (Cl. 106-122). A mixture of 6 cubic feet of mangled cellulose, one cubic foot of asbestos, one pound of divided titanium oxide, soap, copper sulphate, cream tartar, sodium bicarbonate and a water-soluble binder.

2,301,996. Method for preserving documents and the like. William J. Barrow, Richmond, Va. Filed Jan. 10, 1941. 12 claims. (Cl. 154-2). A method involving the use of a homogeneous protective sheet of thermoplastic cellulose derivative without an interposed adhesive.

2,302,020. Decorative tile. Emile Frederick, Ja., assignor to The Celotex Corporation, Chicago, Ill. Filed May 19, 1937. 9 claims. (Cl. 92-39). Process of forming fissures and pits in a sheet of sound absorptive plastic material.

2,302,053. Container coating machine. John F. Price, assignor to Oswego Falls Corporation, Fulton, N. Y. Filed July 26, 1939. 4 claims. (Cl. 91-46).

2,302,096. Applying pigments to sheet material. Alfred Pierssene Battey, assignor to McCorquodale and Company, Limited, London, England, and Denis Kavanagh L'Estrange, Wanstead, Essex, England. Filed March 22, 1940. 17 claims. (Cl. 91-47). Apparatus for applying pigment to the surface of a number of sheets of paper, board or other sheet material singly in succession.

2,302,104. Electronic micrometer. Robert W. Carson, Little Falls, N. J. Filed June 20, 1942. 12 claims. (Cl. 33-164).

2,302,144. Method of making transversely flexible corrugated paper. David Harcourt Plewes and Bernard A. Fox, assignors to Dominion Corrugated Paper Company Limited, Toronto, Ontario, Canada. Filed Feb. 17, 1942. 5 claims. (Cl. 154-33.05). The corrugated sheet is treated by sharply bending the ribs inwardly first in a diagonal transverse direction and then inwardly in a substantially opposite diagonal transverse direction without appreciably permanently deforming the fibs.

2,302,183. Roofing material. Frank B. Burns, assignor to United States Gypsum Company, Chicago, Ill. Filed Aug. 10, 1940. 5 claims. (Cl. 108-7). A method of surfacing a roofing shingle.

2,302,270. Pulp making process. Max Skolnik, Chicago, Ill. Filed April 12, 1938. 8 claims. (Cl. 02-13). Straw is subjected to a mild alkaline cooking liquor at a temperature below the boiling point and at substantially atmospheric temperature, the cook being controlled by the proportions of sodium hydroxide and carbonate used.

2,302,309. Stabilization of wet processed starch pastes with ureaformaldehyde. Sivert N. Glarum and Joseph J. Thomas, assignors to Röhm & Haas Company, Philadelphia, Pa. Filed Oct. 19, 1939. 9 claims. (Cl. 260-9). Starch is partially hydrolyzed in a wet way to form a paste, a water-soluble carbamide-aldehyde reaction product is added at a pH between 7 and 10, and the mixture is heated.

2,302,310. Stabilized partially hydrolyzed starch pastes. Sivert N. Glarum and Joseph J. Thomas, assignors to Röhm & Haas Company, Philadelphia, Pa. Filed Oct. 19, 1939. 11 claims. (Cl. 260-9). One part of water-soluble carbamide-aldehyde condensate is added to four parts of partially hydrolyzed starch in a wet way.

2,302,326. Automatic consistency control. Richard D. Kehoe and Curt Weil, assignors to Paper and Industrial Appliances, Inc., New York, N. Y. Filed Nov. 28, 1940. 4 claims. (Cl. 137-78).

2,302,327. Automatic consistency control means. Richard D. Kehoe and Curt Weil, assignors to Paper and Industrial Appliances, Inc., New York, N. Y. Filed July 25, 1942. 6 claims. (Cl. 265-11).

2,302,332. Coating process. Robert M. Leekley, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed April 9, 1940. 11 claims. (Cl. 117-16). Process of applying a continuous coating of a fiber-forming synthetic linear polyamide to an object.

2,302,378. Adhesive. Robert T. Rasmussen, Merrick, N. Y. Filed March 7, 1939. 4 claims. (Cl. 260-740). An aqueous dispersion of casein and latex with sodium 2,4,5-trichlorophenate.

November 24, 1942

2,302,711. Coated abrasives. Nicholas E. Oglesby and Franklin Strain, assignors to Behr-Manning Corporation, Troy, N. Y. Filed Feb. 6, 1937. 13 claims. (Cl. 51-298). Method of manufacturing a coated abrasive with a synthetic resin adhesive.

2,302,855. Cutting apparatus. Harold E. Hallman, Catonsville, Md. Filed Dec. 6, 1939. 8 claims. (Cl. 164-28). An apparatus for forming successive perforations in sheet material.

2,303,087. Apparatus for compressing creped wadding. Richard N. Keller, assignor to Paper Patents Company, Neenah, Wis. Filed Dec. 24, 1938. 8 claims. (Cl. 154-1). An apparatus for effecting endwise compression of flat creped wadding pads.

2,303,257. Method and apparatus for impregnating fibrous material. William Boyd Campbell, Otto Maass and Ernest Edward Massey, assignors to Imperial Tobacco Company of Canada, Limited, Montreal, Quebec, Canada. Filed July 31, 1940. 11 claims. (Cl. 117-61). A method of impregnating materials in the form of rolls.

December 1, 1942

2,303,322. Fibrous container manufacture. Richard P. Bigger, assignor to American Can Company, New York, N. Y. Filed March 8, 1941. 4 claims. (Cl. 93-35.1). Method of forming an oil and grease leakproof end seam.

2,303,345. Process of making predominantly plastic material and tough products thereof from lignocellulose. William H. Mason and Robert M. Boehm, assignors to Masonite Corporation, Laurel, Miss. Filed March 30, 1939. 9 claims. (Cl. 106-163). In the preparation of a plastic material from lignocellulosic material, a salt of a weak acid is added to buffer the acid developed in the steam treatment.

2,303,346. Method of making labels. Carl A. Flood, assignor to Dennison Manufacturing Company, Framingham, Mass. Filed Dec. 23, 1938. 21 claims. (Cl. 154-2).

2,303,436. Method of making rigid articles. Kempton Clark, assignor to American Seal-Kap Corporation of Delaware, Wilmington, Del. Filed Oct. 23, 1937. 3 claims. (Cl. 18-56). A paper base is impregnated with a dispersion of urea resin and a stiffening agent, and molded cold.

2,303,513. Adhesive-applying apparatus. Frank Raymond Thresh, assignor to Hoague-Sprague Corporation, Lynn, Mass. Filed Sept. 27, 1939. 9 claims. (Cl. 91-51).

2,303,612. Web-washing apparatus. Lynn B. Case, assignor to John Waldron Corporation, New Brunswick, N. J. Filed Sept. 20, 1940. 1 claim. (Cl. 68-205).

2,303,791. Adhesives. Paul B. Davidson and Julius R. Adams, assignors to Old Colony Envelope Company, Westfield, Mass. Filed March 17, 1941. 4 claims. (Cl. 106-210). A paper envelope adhesive consists of a partially dextrinized starch, water and an amide of a monocarboxylic acid with 2-5 carbon atoms.

2,303,809. Device for moistening paper, fabrics, and like weblike material. Carl Gustav Anderson, assignor to Aktiebolaget Svenska Fläktfabriken, Stockholm, Sweden. Filed April 12, 1940. 3 claims. (Cl. 34-159).

2,303,811. Chemical recovery system for pulp mills. John Phillips Badenhausen, assignor of one-half to Day and Zimmermann, Incorporated, Philadelphia, Pa. Filed Jan. 9, 1940. 1 claim. (Cl. 23-262). A method of passing exhaust gases from a chemical recovery furnace through contact compartments while waste liquor is sprayed downwardly through the compartments.

2,303,931. Process for concentrating phosphate ores. Ernest W. Greene and Charles W. Head, assignors to Phosphate Recovery Corporation, Chicago, Ill. Filed April 25, 1940. 7 claims. (Cl. 209-166). The flotation agent contains a mahogany soap, tall oil, and a fuel oil.

2,303,982. Adhesive. Alfred Brookes, assignor to American Cyanamid Company, New York, N. Y. Filed June 23, 1941. 8 claims. (Cl. 260-9). An adhesive comprises an aqueous urea-formaldehyde resin and a comminuted cellulosic filler previously impregnated with benzyl alcohol.

2,304,048. Wrapping machine safety mechanism. Thormod Jensen, assignor to American Machine and Foundry Company, New York, N. Y. Filed June 5, 1941. 17 claims. (Cl. 93-2).

December 8, 1942

2,304,102. Protein composition. Percy L. Julian, Andrew G. Engstrom and Elmer B. Oberg, assignors to The Glidden Company, Cleveland, Ohio. Filed April 19, 1939. 12 claims. (Cl. 106-154). A stable protein solution comprises a soybean protein, an alkaline solvent, boric acid, a water-soluble polyhydric alcohol and water, the pH being between 5 and 8.

2,304,123. Embossed decorative fabric. William Wallace Rowe, assignor to Cincinnati Industries, Inc., Cincinnati, Ohio. Filed Aug. 19, 1938. 12 claims. (Cl. 154-2). A method of embossing a stretchable paper attached to a realtively thin boxboard.

2,304,287. Manufacture of grease-resistant paper. Milton O. Schur, assignor to Reconstruction Finance Corporation, Washington, D. C. Filed March 23, 1939. 13 claims. (Cl. 117-83). A paper sheet is primed on its surface with bentonite-binder composition, and filmed on the primed surface with zein and then waxed.

2,304,326. Reduction of fibrous materials. Joseph B. Adams and Roland B. Respess, assignors to Respats, Inc., Cranston, R. I. Filed June 7, 1940. 6 claims. (Cl. 92-26).

2,304,361. Method of making paper. William Hoskins, Jr., La Grange, Ill., assignor to Howard D. Meincke. Filed Oct. 31, 1938. 2 claims. (Cl. 92-21). A paper filler consisting essentially of a slurry of gypsum containing at least 0.5% of alum.

2,304,395. Rear folder for wrapping machines. Stephen M. Bodolay, assignor to Package Machinery Company, Springfield, Mass. Filed Nov. 4, 1940. 15 claims. (Cl. 93-2).

2,304,396. Wrapping machine folder. Stephen M. Bodolay, assignor to Package Machinery Company, Springfield, Mass. Filed April 7, 1941. 7 claims. (Cl. 93-2).

2,304,428. Wrapping machine. Elmer Lovell Smith and Carlton Wetsel, assignors to Package Machinery Company, Springfield, Mass. Filed May 12, 1941. 10 claims. (Cl. 92-3).

2,304,429. Casein manufacture. John R. Spellacy, assignor to Hercules Powder Company, Wilmington, Del. Filed March 28, 1939. 4 claims. (Cl. 260-120). Casein is precipitated by spraying concentrated acid on a rapidly moving swirling thin stream of skim milk.

2,304,600. Production of adhesives. Hans Scheuermann, assignor to Plaskon Company, Incorporated, Toledo, Ohio. Filed March 14, 1939. 4 claims. (Cl. 260-29). Condensation products of urea and thiourea with formaldehyde and up to 30% of a water-soluble aliphatic amine containing at least two amino groups.

2,304,659. Stereotype mat. Arlie W. Schorger, assignor to Burgess Cellulose Company, Freeport, Ill. Filed Oct. 17, 1940. 11 claims. (Cl. 22-5.5). A fibrous stereotype mat containing at least 5% of a vegetable protein or casein.

2,304,730. Adhesive. Paul B. Davidson and Julius R. Adams, assignors to Old Colony Envelope Company, Westfield, Mass. Filed March 17, 1941. 4 claims. (Cl. 106-213). A partially dextrinized starch and an ester of carbamic acid.

2,304,735. Paper making apparatus. William M. Leeson, assignor to The Sandy Hill Iron & Brass Works, Hudson Falls, N. Y. Filed Aug. 4, 1939. 2 claims. (Cl. 92-43). An improvement to a cylinder mold machine including a vat and slice mechanism.

December 15, 1942

2,304,787. Nondrying adhesive label and method and apparatus for making same. Ray Stanton Avery, Los Angeles, Calif. Filed April 12, 1939. 10 claims. (Cl. 154-1).

2,304,818. Art of coating paper. William F. Grupe, assignor to John R. Ditmars, New Brunswick, N. J. Filed May 1, 1940. 6 claims. (Cl. 117-103).

2,304,819. Art of coating paper. William F. Grupe, assignor to John R. Ditmars, New Brunswick, N. J. Filed June 18, 1940. 6 claims. (Cl. 91-55).

2,305,098. Protective paper and ink therefor. Festus L. Minnear, assignor to Columbian Bank Note Company, Chicago, Ill. Filed July 15, 1940. 3 claims. (Cl. 106-23). An ink adapted to be applied to a paper base to form a protective paper.

2,305,157. Coated abrasive. Everett G. Ham, assignor to Behr-Manning Corporation, Troy, N. Y. Filed July 17, 1936. 7 claims. (Cl. 51-295). A paper backing containing regenerated cellulose as an agent to impart wet strength, a water-resistant paper treatment, a binder for abrasive grains and abrasive grains held by the binder.

2,305,281. Rossing machine. James D. Taylor and Wallace E. Jones, assignors to Taylor-Colquitt Co., Spartansburg, S. C. Filed Nov. 4, 1940. 3 claims. (Cl. 144-208).

2,305,300. Papermaking machine deckle. John C. Lowe, assignor to Lowe-Deckle Mfg. Corporation, Perkasie, Pa. Filed April 24, 1939. 4 claims. (Cl. 92-43). Means for spraying a liquid against the cylinder to remove stock at the side margin of the sheet of paper formed on the cylinder.

2,305,404. Method of making clay fillers. Wilson F. Brown, assignor to The Champion Paper and Fibre Company, Hamilton, Ohio. Filed Sept. 8, 1939. 4 claims. (Cl. 83-94). A method of working clay under pressure between relative-moving, pressure-applying, crushing elements.

2,305,424. Adhesive strip delivering means. Robert W. Hoitt, assignor to Nashua Gummed and Coated Paper Company, Nashua, N. H. Filed Aug. 3, 1940. 8 claims. (Cl. 91-38).

2,305,470. Creping treatment. George E. Gibbs, assignor to American Reenforced Paper Company, Attleboro, Mass. Filed Aug. 1, 1940. 4 claims. (Cl. 154-30). Apparatus for imparting stretchability to a paper web.

2,305,483. Process of consolidating or waterproofing mortar. Carl Letters, vested in the Alien Property Custodian. Filed June 2, 1941. 5 claims. (Cl. 106-85). Sulphite waste liquor is used in waterproofing mortar.

2,305,488. Asbestos product. Robert E. Parry, assignor to Johns-Manville Corporation, New York, N. Y. Filed Jan. 5, 1938. 4 claims. (Cl. 154-44). A tubular heat insulating article is built up of sheets of asbestos paper.

2,305,493. Method of making sulphite pulp. Donald C. Porter and Walter H. Swanson, assignors to Paper Patents Company, Neenah, Wis. Filed Sept. 19, 1940. 6 claims. (Cl. 92-11). A method of substantially reducing the normal drop in liquor circulation during the blowing drum of a digester which comprises reducing the pressure in an interrupted stepwise manner.

2,305,494. Milk bottle cap. John F. Price, assignor to Oswego Falls Corporation, Fulton, N. Y. Filed June 24, 1940. 2 claims. (Cl. 215-38). A thermoplastic resin is used as a waterproofing agent.

2,305,498. Tall oil treatment. Ernest Segessemann, assignor to National Oil Products Company, Harrison, N. J. Filed Dec. 16, 1939. 7 claims. (Cl. 260-97.5). Tall oil is partially hydrogenated to convert the highly unsaturated fatty acids to at least oleic acid and a solution in an organic solvent is chilled to precipitate the fatty acids.

December 22, 1942

2,305,630. Logging equipment. Donald John McNeil, assignor to Willamette Hyster Company, Portland, Oreg. Filed May 24, 1941. 14 claims. (Cl. 214-65.3).

2,305,735. Papercutting machine. William M. Reichart and Rudolph J. Vanek, assignors to The Chandler & Price Company, Cleveland, Ohio. Filed Sept. 14, 1940. 2 claims. (Cl. 164-54). A clamp actuating mechanism for paper cutting machines.

2,305,744. Bottle cap. Rudolph Sonnenberg, assignor to Mid-West Bottle Cap Co., Belvidere, Ill. Filed June 24, 1938. 4 claims. (Cl. 213-38). Method of manufacturing a bottle cap from paper.

2,305,849. Metallized condenser paper. Walter Dorn, vested in the Alien Property Custodian. Filed Sept. 30, 1938. 6 claims. (Cl. 117-37). A metallized paper for an electrostatic condenser; a strip of silver or copper is parallel to the margin and a strip of magnesium, aluminum, cadmium or zinc next to the first strip with the edges meeting in conductive connection.

2,305,920. Coating composition. Rudolf Endres, vested in Alien Property Custodian. Filed Jan. 24, 1940. 9 claims. (Cl. 106-176). A coating composition consists of a cellulose ester of ether and a tetrahydrofurfuryl ester as a plasticizing agent.

2,305,998. Apparatus for forming deodorized paper plates. Paul R. Simmons, Lansdale, Pa. Filed Oct. 22, 1941. 13 claims. (Cl. 18-35). A combination of male and female dies for forming plates from flat paperboard stock.

2,306,046. Composite structure. Fred W. Duggan and Frazier Groff, assignors to Carbide and Carbon Chemicals Corporation, New York, N. Y. Filed May 12, 1939. 14 claims. (Cl. 117-72). A film of vinyl resin is applied to fibrous material by calendering, over which is placed a continuous, adherent and very thin film of a hydrocarbon wax to assist in resisting the transmission of water vapor. The resin and wax may be mixed before application and the film treated with a liquid wax solvent.

2,306,178. Process of laminating multiply webs. Robert E. Meany, assignor to Wm. Wrigley Jr., Company, Chicago, Ill. Filed Nov. 8, 1939. 1 claim. (Cl. 154-2). A process of laminating a multiply web having the lateral edges of the plies in approximate registration, using a thermoplastic material.

2,306,222. Method of rendering materials water repellent. Winton I. Patnode, assignor to General Electric Company, Schenectady, N. Y. Filed Nov. 16, 1940. 18 claims. (Cl. 117-106). The material is treated with the vapors of an organo-silicon halide and then with the vapors of an alkaline reagent.

2,306,297. Method of treating mica. Francis Clarke Atwood, assignor to Atlantic Research Associates, Inc., Newtonville, Mass. Filed Dec. 1, 1939. 1 claim. (Cl. 83-94). In a method of wet grinding mica, a deflocculating agent is used, consisting of a polyose, sulphite waste liquor and modifications thereof, lignin and tannin liquors, etc.

2,306,352. Tall oil metal compound and process of making same. Harry Burrell, assignor to Ellis-Foster Company, Montclair, N. J. Filed Dec. 16, 1939. 1 claim. (Cl. 260-97.5). One equivalent weight of tall oil is heated with at least one-third mole of red lead.

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2,306,400. Infusion package heat sealing filter-paper manufacture. Theodore F. Menzel, Long Island City, N. Y., assignor to Millie Patent Holding Co., Inc. Filed Dec. 18, 1940. 12 claims. (Cl. 117-16). A finely divided polymerizing resin is sprinkled over the traveling surface portions of a thin filter sheet material, the resin is heated and pressed into the surface.

2,306,466. Winding apparatus. Charles Robley Patterson, assignor to Certain-teed Products Corporation, New York, N. Y. Filed Feb. 3, 1940. 9 claims. (Cl. 242-55).

2,306,478. Moistureproof sheet wrapping material. Harold Stephens Holt, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Nov. 1, 1939. 12 claims. (Cl. 117-146). The moistureproofing coating consists essentially of moistureproofing wax, film former and phenol-modified rubber, the latter being a reaction product of rubber and phenol containing 1-5% of the phenol chemically combined with the rubber, which is resinous, thermoplastic, benzene soluble, and acid and alkali resistant.

2,306,487. Adhesive. James A. Mitchell, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Nov. 1, 1939. 12 claims. (Cl. 117-122). An adhesive tape consists of regenerated cellulose having a thin coating of phenol-modified rubber plasticized with chlorinated paraffin wax.

2,306,576. Lined container. Albin H. Warth and William C. Rainer, assignors to Crown Cork & Seal Company, Inc., Baltimore, Md. Filed Dec. 17, 1938. 2 claims. (Cl. 220-64). A container for food products having a wax lining, the wax having not more than 2% of a high melting point amorphous wax (melting between 221° and 226° F.).

2,306,672. Structure and arrangement of the coacting bars of jordan engines. Elmer C. Tucker, assignor to E. D. Jones & Sons Co., Pittsfield, Mass. Filed Aug. 31, 1938. 5 claims. (Cl. 92-27). Fillings of bars for the tapering shell and plug of a jordan engine which are realtively adjustable longitudinally to compensate for wear of the working faces of the bars.

2,306,822. Attachment for box folding machines. Clarence E. Maul, assignor to The Clark Thread Company, Newark, N. J. Filed April 12, 1941. 10 claims. (Cl. 93-54.2).

Calco Get Army-Navy "E"

On Wednesday, January 20, workers and management of the Calco Chemical Division, American Cyanamid Company at Bound Brook received the Army-Navy "E" Award for excellence in war production from General Alden H. Waitt, Chemical Warfare Service, Army of United States, and insignia pins for every employee from Commander Herman J. McCarthy, United States Navy, in a colorful ceremony which was broadcast throughout the metropolitan area over radio station WJZ.

The presentation, which was held in one of the plant buildings, featured fighting speeches by General Waitt and Commander McCarthy and a gracious address of acceptance by F. M. Fargo, Jr., General Manager, and Frank J. Pucci, President of the Chemical Workers Union Local.. Paul Robeson, famous negro baritone, opened the ceremonies with the song, "America," and concluded them with his rendition of the national anthem in which the audience of more than 4,000 joined.

Telling the audience that "this is your war every bit as much as it is the war of the soldiers at the front," General Waitt indicated the vast importance in the war effort of the place held by workers in the chemical industry. "Without them," he said, "many lives would be lost through lack of proper medication. Without them, essential camouflage, based upon fast-to-light dyestuffs, would be impossible. Without them, rubber in its myriad forms would harden and crack and be all but useless to the United Nations' war machine."

He was preceded by Representative Charles A. Eaton of New Jersey, who made a stirring appeal for "more and more" production.

In his address of acceptance Mr. Fargo told his listeners that although they had every reason to feel proud of the outstanding production record for the preceding year even greater efforts would be required of them in the year to come. He indicated the fact that the War and Navy Departments are calling upon the Chemical Industry for an ever-increasing volume of heavy and intermediate chemicals, and promised on the behalf of the Calco personnel that no effort would be spared to meet and even exceed the responsibilities thus imposed on the organization.

Navy "E" insignia pins were presented in person to 18 old employees by Commander McCarthy and provision was made for an insignia pin and certificate for every employee. The ceremonies were presided over by E. J. Dempsey, works manager at Calco.

TAPPI Notes

Three college alumni luncheons will be held during the annual meeting of the Technical Association of the Pulp and Paper Industry to be held at the Commodore Hotel, February 15-18, 1943.

The University of Maine luncheon will be held at the Commodore on Wednesday, February 17.

The Massachusetts Institute of Technology luncheon will be held at the M. I. T. Club, 24 East 39th street, New York, N. Y., on Tuesday, February 16.

The New York State College of Forestry luncheon will be held at the Commodore on Tuesday, February 16.

S. Steinberg, formerly of the New York Times, is now in Company B, 82nd Chemical Battalion, Fort Bliss, Texas.

Ralph B. Millington, formerly of the Stevens Paper Mills, is now chemical engineer for the Carter Ink Company, Boston, Mass.

The Empire State Section of TAPPI will meet at the Syracuse University Club, Syracuse, N. Y., on Friday, February 12, at 7:00 P. M., H. G. Specht of the Eastwood-Nealley Company, will discuss "Technical Aspects of Fourdrinier Wires."

Head Bradner Smith & Co.

The directors of Bradner Smith & Co. announce the appointment of Alfred J. Westrick as chairman of the board and Wilfred L. Shea as president.

The Measurement and Influence of Bonding between Paper Fibers*

By James d'a Clark[1]

Abstract

The adhesion between fibers in a sheet of paper is dependent on the extent of fiber surfaces in actual contact, the strength per unit area of the joints, and the flexibility of the joints. It is a complex quantity, and there exists no satisfactory means of measuring it directly. Various indirect methods for measuring it are briefly reviewed and two new methods, "shear" and "split" adhesion tests, are discussed in detail, together with experimental data relating to them. The "% Adhesion" method, using a recently improved zero-span tensile attachment, is also considered. Data are given on the effect of beating, of fiber length, and of the addition of mucilage on bonding. It would appear that the new "shear" adhesion test is as satisfactory as any; it may be applied also for measuring the adhesion between the plies of multicylinder boards.

The physical strength of a sheet of paper may be considered as dependent upon (1) the length of the individual fibers, (2) the strength and similar properties of the individual fibers and, usually of equal or greater importance, (3) the extent and degree of adhesion between the fibers in the formed sheet.

The measurement and influence of fiber length have been recently discussed by the author (*1*), and it is hoped that some work on the strength and allied properties of fibers can be reviewed in a forthcoming paper. The present article deals with measurements and a discussion of some factors relating to the adhesion of fibers, excluding for the present, however, hydration and the nature of fiber bonding.

Adhesion between Fibers

The adhesion between fibers in a sheet of paper may be considered as being governed by (*a*) the extent of the surface of the fibers in mutual contact, (*b*) the strength per unit area of the joints, and (*c*) the flexibility of the joints.

The extent of the surface of the fibers in mutual contact in an unfilled sheet of paper is that fraction of the specific surface of a pulp (the exterior area per gram) in actual contact, multiplied by the weight of the sheet. The specific surface of pulp may be measured quite accurately, by silvering the fibers and then measuring their catalytic action on dilute hydrogen peroxide as described by the author (*2*). The proportion of the exterior surface of the fibers in a sheet in mutual contact can be determined by the simple optical method described by Parsons (*3*), wherein the scattering coefficient of a sheet of loosely felted pulp (prepared by forming in alcohol) is compared with that of a normal test sheet made from the same pulp. The apparent density of the sheet structure resulting, for example, from a change in fiber flexibility or in wet pressure during sheet formation, clearly influences the proportion of fibers in contact. Factors influencing density will be discussed in another paper.

The strength per unit area of the joints has not as yet been measured directly. The complex nature of the fiber surfaces and the fact that the fibers and fibrillae are not rigid make the formulation of a satisfactory procedure for the measurement of the property problematical.

The ability of the joints in the fibrous structure to reorient themselves under stress without breaking is concerned with the flexibility of the fibers and their fineness. The extent to which the fibers are mashed or reticulated during beating, their fibrillation, and the degree to which these structural changes are preserved during pressing and drying are directly contributory to these two factors. It is difficult to conceive of this property of bond flexibility being independently measurable.

Adhesion between fibers, together with their intertwining, may be looked upon as the means of enabling their ultimate strength to be brought into play when the sheet is put under stress. The adhesion provides the necessary binding or frictional resistance between adjacent fibers, so that, when put under a load it is held in place by lateral adhesion to its neighbors; if sufficient, this adhesion allows it to resist the applied stress up to the limit of its tensile strength.

There are a number of methods available for empirically measuring the over-all property of adhesion between fibers, all of which, however, are affected to some extent by the factor of fiber length and to a lesser extent, by that of fiber strength.

"% Adhesion" Method

Hoffmann Jacobsen (*4*) proposed measuring this over-all property as the "% Adhesion," which he defined as the percentage ratio of the normal tensile breaking load of a test sheet to the zero-span tensile breaking load, obtained with the jaws of the tensile tester touching. To secure good results, it is necessary to use a specially designed zero-span attachment for the tensile instrument because the fibers must be clamped tightly and uniformly along the line where the edges of the upper and lower jaws meet on the specimen. It is clear that, under these conditions where the fibers cannot slip, a measurement of the maximum tensile strength of the paper is obtained which will correspond to the ideal case, in which the adhesion or fiber-to-fiber bonding is equal to or greater than that required to enable the whole of the potential strength of the fibers themselves to be realized. For a compact, well-beaten paper, the "% Adhesion" approaches 100; for a bulky, soft paper, it may be less than 10.

This special tensile test method is an interesting one for other reasons; for instance, it gives a result ap-

* Presented at the Fall Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Statler, Boston, Mass., Sept. 29-Oct. 1, 1942.
A portion of the thesis submitted in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Doctor of Philosophy from Lawrence College, Appleton, Wis., June, 1941.

[1] Member, TAPPI; Research Associate, The Institute of Paper Chemistry, Appleton, Wis.

proaching the maximum realizable normal tensile strength after beating by merely testing a sheet of unbeaten or moderately beaten pulp, thus eliminating the necessity of special laboratory beating for this purpose. A full discussion of this test is beyond the scope of the present paper; however, Fig. 1 shows the attachment designed and used in this work and some experimental data are given in Experiments E, F, and G.

Unfortunately, for several reasons, the "% Adhesion" is not a wholly satisfactory test for measuring fiber bonding despite its simplicity, reproducibility, and direct practical value, for it is clearly influenced by factors other than adhesiveness. For instance, the normal tensile test (which forms part of the ratio) is influenced by the length of the fibers, which allows a better weaving of the fibers into the sheet structure. A short fiber may be pulled out of a sheet more easily than a longer one, although both may have the same degree of adhesion. This special tensile test and calculation of "% Adhesion" has been carefully examined by Günther *(5)*, Grund and his coworkers *(6, 7)*, and others.

The adhesion may be measured more directly in several other ways—for example, by determining the transverse tensile strength of a test sheet, as suggested in 1903 by Klemm *(8)*, and later by Sutermeister and Porter *(9)* and by Abrams *(10)* for boards. The test consists of cementing a pair of blocks with a suitable adhesive (usually sodium silicate) on either side of the sheet of paper and measuring the tensile load which is required to split the paper. Brecht and Blikstad *(11)* have also studied this test and the "% Adhesion" test just discussed.

Other Methods for Adhesion

Allison *(12)* made bonding-strength measurements of a sample of Mitscherlich sulphite pulp after different periods of disintegration by ingeniously forming the wet fibers into a thin strand or rope, so as to have them all aligned, and then measuring the tensile breaking stress of the rope after it had been dried. However, the results were not very reproducible.

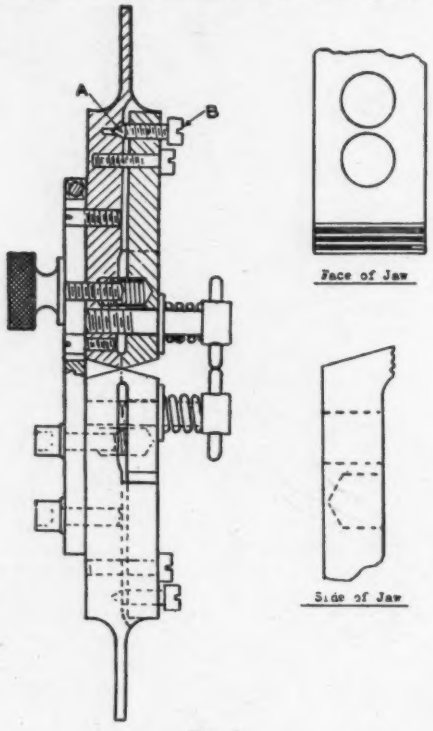

Fig. 1
Zero-Span Jaw Attachment

Brown *(13)* carried out an investigation of factors relating to the adhesion of multi-ply boards and of fibers. He measured the tensile force required to start the splitting of a multi-ply sheet and also the maximum force required to continue this splitting with a tensile tester, but he found the results uncertain. Using a perpendicular bonding test similar to that used by Abrams *(10)*, only fair reproducibility was obtained. More uniform results (within 8%) were secured by measuring the work done in splitting the plies on an Elmendorf tearing tester.

Doughty and Baird *(14)* measured the adhesion by measuring the direct force necessary to continue a split along a 15-mm. wide strip, using for the purpose an adapted ordinary triple-beam balance. They stated that the uniformity of the individual measurements was within 3%. They found no increase in the test results after increasing the pressure on a wet, single-ply sheet from zero to 500 p.s.i. This indicates one of the defects of the splitting test as a measure of interfiber bonding, as undoubtedly the adhesive force between the fibers is increased with greater wet pressures. The writer, too, found that, on continued beating, the split adhesion test dropped after reaching a maximum. It is clear that the stiffer the webs, the lower will be the splitting test. For example, a split test on a sheet of natural mica with either procedure would give a negligible reading, whereas the bond between the adjacent lamellae of mica is quite strong under either direct tension or shear.

A simple method involving shear, which more nearly approaches measuring what is conceived to be the adhesion strength of a sheet, takes into account the adhesion and interlocking of the fiber surfaces, and is not greatly affected by fiber length, has been described by the writer *(15)*. It consists of doubling a strip of material to be tested in the form of a V, inserting another strip for a distance of 2 cm. into the V—thus, ⩛—pressing between dry blotters at 1000 p.s.i. for 30 minutes, removing, trimming to a width of 15 mm., conditioning, and measuring the tensile load required to pull the inserted strip from the other. The figures obtained for nonmoistureproof cellophane were about .044 kg./sq. cm. of adhering surface when the sheets were wetted and the grain of each was in the direction of the pull, and 0.3 kg./sq. cm. when the grains were crossed. Moistureproofed cellophane gave a negligible test under these conditions.

The details of this technique are not suitable for moist pulp test sheets because the area of the two strips in contact would have to be very small and, during the course of arranging the strips, moisture might be lost and a special pressing would be necessary. It was decided, therefore, that it would be much simpler to press a pair of moist pulp test sheets together when the rest of the standard test sheets were made and use this duplex circular sheet, which could easily be separated at the edges beyond the circle where it is clamped by the rings used for holding the test sheets during drying, for subsequent tests of adhesion.

Two New Methods

Two methods of testing were developed. One was based on the principle just mentioned—that is, the

preparation of 15-mm. wide test strips from the duplex sheet in the form of an X with an area of 30 sq. mm. in contact (using the template shown in Fig. 2) and testing by placing the diagonally opposite tabs in the jaws of a tensile tester, as shown in Fig. 3. The other method requires the cutting of samples from the duplex sheet in the form of a 40-sq. cm. rectangle with a X-shaped lower edge, as shown in Fig. 4, and with the sheets at this edge separated so as to form two tabs. The tabs are gripped in the Thwing-Elmendorf tear tester by jaws especially designed for the purpose, as shown in Figs. 5 and 6, and a measurement is made of the work done in separating a duplex surface 40 sq. cm. in area. The test is similar in principle to the one used by Brown *(13)*.

Details of both the shear and split adhesion tests are given in the Appendix.

A. Differences in Bonding between Wire and Felt Sides of Test Sheets (Split Adhesion Method)

Two sets of duplex sheets were made from a bleached West Coast sulphite (beaten to 64 r.p.g. in the laboratory kollergang), one set having the top sides of both sheets in contact and the other having the wire side of one sheet in contact with the top side of the other. Besides using specimens having an area of 40 sq. cm. as given in the adopted procedure, test specimens having an area of 20 sq. cm. were cut from the remaining segment of each duplex sheet and tested with results shown in Table I.

TABLE I.—EFFECT OF PRESSING AND TEST AREA ON SPLIT TEST

Pressing Condition	Area of Specimen, sq. cm.	Average Reading	Work g.-cm./ sq. cm.
Top against top	40	24.4	62
Top against top	20	14.8	57
Top against bottom	40	20.2	48
Top against bottom	20	12.8	46

It will be seen that there is a significant difference in the results, depending on whether the top is against the top or against the wire side of the sheet. It is known that there is usually more fine material in the top layer than in the wire or bottom side of a sheet, and the effect of this fine material is to enhance the bonding strength, as would be expected.

There is a minor difference in results caused by the area of the test specimen. It is doubtful whether this is significant, especially in view of a few other occasional comparison tests during the work *(see C)*.

B. Effect of Test Area on Bonding Strength (Shear Method)

Test strips were cut from three sets of duplex standard test sheets made from unbeaten (U), moderately beaten (8 r.p.g.) and fairly well-beaten (32 r.p.g.) West Coast bleached sulphite. Sets of specimens were prepared according to the adopted procedure, having test areas of 3.3 × 15 mm. and 2.0 × 15 mm. These gave the following results:

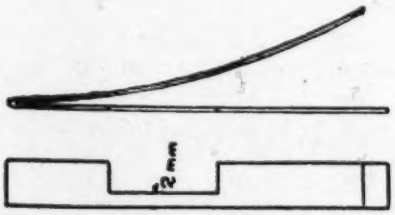

FIG. 2
Template for Shear Adhesion Test

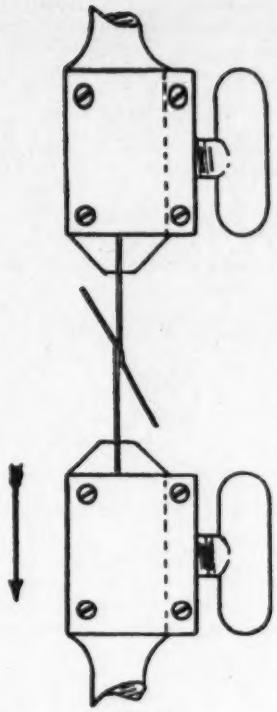

FIG. 3
Shear Adhesion Test

TABLE II.—EFFECT OF TEST AREA ON SHEAR TEST

Area of Specimen, mm.	Beating, r.p.g.	Reading	Shear, kg./sq. cm.
3.3 × 15.0	U	2.8	2.6
3.3 × 15.0	8	7.0	6.4
3.3 × 15.0	8*	8.9	8.2
3.3 × 15.0	32	13.7	12.4
2.0 × 15.0	U	1.8	2.7
2.0 × 15.0	8	7.1	10.7
2.0 × 15.0	8*	5.6	8.5
2.0 × 15.0	32	10.5	15.9

* Double-weight duplex sheet—each single sheet 120 g./sq. m.

Because of the frequent fracture of the test strips in the tests when the greater area was used, it cannot be definitely decided whether or not there is a proportionality in the results according to the areas in contact. From one-fourth to two-thirds of the test specimens prepared were damaged and gave a test of zero or a very low value. As experience was gained, the percentage of successful tests rose to over 80. This

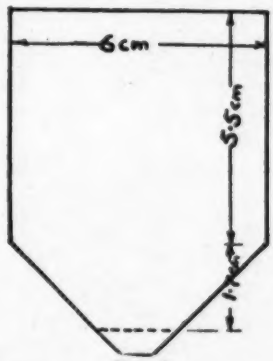

FIG. 4
Template for Split Adhesion Test

percentage fell to nearly 50 with the stiffer specimens from the heavier sheets, which were tested in the next experiment (C).

C. Effect of Basis Weight on Bonding Test (Shear Method)

At the same time as the sheets for the above experiment were made, duplex test sheets (each having double the substance of the standard test sheets) were prepared using a proportionate number of blotters in the press during pressing. These were cut into strips 15 mm. wide, split to give test areas 2 mm. wide, and tested with the following results:

TABLE III.—EFFECT OF BASIS WEIGHT ON BONDING STRENGTH (SHEAR METHOD)

Basis Weight*, g./sq. m.	Beating, r.p.g.	Shear, kg./sq. cm.
120	U	2.4
60	U	2.7
120	4	6.4
60	4	8.0
120	8	8.5
60	8	10.7

* Basis weight refers to the single sheet, not to the duplex.

From the limited data above, it would appear that there is a decrease in the test results when heavier sheets were used. It is believed that this is because of the increased rigidity of the structure with the thicker sheets. Moreover, the moisture content of the sheets after pressing, even after having added two extra blotters to each double-weight duplex sheet in the press, was probably not the same as for normal sheets.

D. Effect of Basis Weight on Bonding Test (Split Method)

Duplex sheets made for Experiment C, including a duplex sheet of half the normal substance, were tested for bonding strength after cutting into 40-sq. cm. test areas as described.

TABLE IV.—EFFECT OF BASIS WEIGHT ON BONDING STRENGTH (SPLIT METHOD)

Basis Weight*, g./sq. m.	Beating, r.p.g.	Average Reading	Work, g.-cm./sq. cm.
120	0	14.0	26
60	0	12.0	19
120	0	21.3	51.5
60	4	18.4	41
30	4	16.5	34.5
30**	4	19.5	45
120	8	25.5	62.5
60	8	21.0	50
30	8	19.5	45

* Basis weight refers to the single sheet, not to the duplex.
** The special 30-g./sq. cm. sheets were made by using normal dilution (half the normal volume) in the sheet machine to reduce the percentage of fine material lost through the wire.

There appears to be a steady decrease in the test result with decrease in basis weight. This is caused, apparently, by an increased proportionate loss of fine material from the pulp through the wire, coupled with the fact that it takes more work to bend the thicker test sheets during splitting, despite the fact that the split should be easier with stiffer sheets. With very well-beaten stock, it is possible that the thinner sheets would give the higher test results because of their greater flexibility, but this was not determined. There is some uncertainty as to the percentage of moisture in the sheets of different substances after the pressing procedure, which would also affect the results, even though an attempt was made to keep this constant by adjusting the number of dry blotters used for the different weights of sheets in proportion to their weight. The moisture in each single couch blotter carrying each pair of sheets during the first pressing was a constant quantity in every case, so that an exact compensation could not be made by adjusting the number of dry blotters used for the pressing.

E. The Effect of Wet Pressing and Beating on Bonding Strength

A sample of bleached West Coast dry sulphite pulp was disintegrated and beaten in a laboratory kollergang for an increasing number of r.p.g. The pulp was made into sheets according to TAPPI Standard T 205 m and tested for various properties, including bonding strength. Table V gives a summary of the results of interest in this discussion. Included, also, are results obtained from the unbeaten pulp made into sheets with minimum wet pressing and also with four times the normal wet pressure.

The results are plotted on a semilog basis in Fig. 7.

It will be observed that, after a moderate amount of beating, the zero-span tensile strength rises only very slowly. The possible explanation for the initial rise is related to the nature of the test. This will be briefly discussed in the comments under Experiment F, and will be dealt with more fully in another paper. Assuming the highest value found (13,900 m.) is the maximum value for the pulp, the "% Adhesion" has been calculated on this basis.

The split adhesion test rises to a maximum at about 32 r.p.g. and then decreases. This is probably caused by the increasing stiffness of the test sheets, which causes the split to be more easily affected; it is this factor which makes the test especially unsuitable for measuring this property with well-beaten or stiff sheets.

The shear-adhesion test is difficult to carry out with weak, unbeaten test sheets because of their lack of strength. It seems possible that better results would have been obtained by making a quadruplex sheet using, as the outer plies, thin sheets of strong, well-beaten pulp, which would serve to reinforce the weaker strips undergoing test.

F. Effect of Fiber Length on Bonding

The long-fibered fraction of the same pulp used in Experiment E was isolated in a classifier, made into heavy sheets, cut fine with a sharp knife, and reclassified into several fractions to insure that the only variable present was exclusively length.

To include the influence of mild mechanical treatment, after testing the standard sheets made from each fraction (which were not dried by heating, but

TABLE V.—CHANGES TO BONDING STRENGTH OF PULP WITH BEATING

	Unbeaten Not Pressed	Unbeaten Extra Pressed	Unbeaten	4 r.p.g.*	8 r.p.g.	32 r.p.g.	64 r.p.g.
Basis weight, g./sq. m.	60.5	65	61.5	61.1	62.5	60.0	59.7
Apparent density (water = 1)	0.30	0.77	0.54	0.65	0.69	0.81	0.88
Breaking length, m.	825	2,370	1,750	3,880	5,120	6,300	7,050
Zero-span breaking length, m.	9,000	9,600	9,450	11,900	12,700	13,200	13,900
"% Adhesion"	9.2	25.7	13.5	32.5	40	47.5	51
"% Adhesion" (on 13,900 m.)	6.1	17	12.6	28	37	46	51
Adhesion split, g.-cm./sq. cm.	....	....	20.0	42.5	50	75	64
Adhesion shear, kg./sq. cm.	....	....	2.7	...	3.0	4.7	8.3

* r.p.g.—revolutions of the kollergang per gram of pulp in the instrument. Between 4 and 8 r.p.g. would normally be used in a mill making bond paper.

in the air), the pieces from the test sheets were gathered, mixed with some of the long-fibered fraction, stirred for 300,000 revolutions in the standard disintegrator (T 205 m), again fractionated, made into sheets, and tested.

Results of interest in the present discussion are given in Table VI.

The unbeaten pulps proved to be too fragile for satisfactory adhesion tests on the duplex sheets. It will be noticed that, with the stirred pulp, both adhesion tests appear to fall uniformly as the fiber length is decreased. The indirect adhesion test ("% Adhesion") also falls uniformly, but with greater dependence on decreased fiber length. Part of this may be explained by the nature of the test itself. Undoubtedly, there is a small zone of material in the interior of the sheet situated between the nip of the adjacent jaws, which is subjected to compression when the two pairs of jaws are tightened for test; the material in this zone cannot resist applied tension during the test until the rest of the structure has moved enough to permit this. In this way, the shorter the fiber, the thicker the test sheet, or the less its apparent density, the more important the effect of this compressed zone becomes.

In general, however, especially as the density of each set of sheets remains quite constant, it is clear that fiber length has an appreciable effect on each of the three adhesion tests described.

G. Effect of Added Mucilage on Bonding

Using the same pulp as in Experiment E, 60 grams (dry) were stirred in 2 liters of water for 11,000 revolutions in the standard disintegrator. Four standard test sheets were made—one as a control and three with increasing quantities of locust bean gum (which was prepared by heating a 0.5% suspension to 80° C. and allowing it to stand overnight to cool and to permit impurities to settle). No alum was used, which might have resulted in better effects because of greater retention of the gum. The results are given in Table VII and are based on the ratio of the air-dry weight of the gum to the dry weight of the pulp.

The results are interesting, but more experimental evidence is required to draw any definite conclusions. The zero-span breaking length is proportional to the density in this case (in accordance with the discussion in the preceding experiment), and the effect of mucilage on both is small. As in Experiment E, the shear adhesion test appears to be as satisfactory as any.

Dixson *(16)* has also shown the result on the burst and tear tests of increasing the adhesion by the addition of gelatin, locust bean gum, and a cellulose gel, and of decreasing the adhesion with quantities of wetting-out agents and tannin. The last condition, possibly by entirely coagulating the surface colloidal solution of cellulose on the fibers, led to sheets having no bonding or strength at all.

The increase in the tearing strength of sheets made from unbeaten pulp may be expected, because a certain minimum amount of adhesion is required to develop the available tearing resistance of the sheet by bonding the fibers sufficiently well together; when this is achieved, further adhesion either has no effect on the tear or produces a negative effect, because the sheet structure is made less flexible, just as it is easier to tear a piece of stiffly starched cloth than the same cloth dampened or without the starch.

Conclusions

From the data presented and from other work, it is believed that the shear adhesion test is as good as any so far developed for the purpose of securing a measurement of the bonding quality of fibers, although the split-adhesion test is more reproducible and may be satisfactory for unbeaten or moderately beaten pulp and the "% Adhesion" test is both more reprocible and simpler to make. All the tests include also the influence of the area of fibers in contact and the flexibility of the joints. The shear-adhesion test is not a pure shear test but is dependent to a large extent on the elongation of the test specimens over the test area. For some purposes, this latter factor could be minimized by facing the duplex sheet or each test specimen on both sides with a metal or other backing. It might be mentioned, in passing, that this test has also shown possibilities in satisfactorily measuring the adhesion between the various plies of multicylinder, machine-made boards.

In the problem ever present to the pulp manufacturer, "Why is this pulp stronger in some way to that?", in all instances the bonding between the fibers plays a major part. For example, a pulp produced by

TABLE VI.—SUMMARY OF DATA ON EFFECT OF FIBER LENGTH

	Unbeaten Fractions				Beaten Fractions				
Sample Number	1	2	3	4	1B	2B	3B	4B	Mixture ½ 1B, ½ 4B
Weighted average fiber length, mm.	2.78	1.50	0.73	0.52	3.08	1.80	0.92	.545	1.81
Apparent density, g./cc.	.458	.455	.451	.455	.513	.508	.513	.518	.535
Breaking length, m.	660	470	330	340	1780	1330	1030	750	1320
Zero-span breaking length, m.	9500	7700	6200	5500	10,300	9800	8300	7200	9500
"% Adhesion"	7.3	6.1	5.2	6.3	18.1	13.6	12.6	10.5	14.0
Adhesion shear, kg./sq. cm.	....	....	.. .	....	1.36	1.13	1.10	Broke	....
Adhesion split, g./sq. cm.	....	....	....	....	17.5	15	15	Broke	....

TABLE VII.—EFFECT OF MUCILAGE ON STRENGTH

Gum added, %	0	0.5	1	2	4	8	16	% Increase 0-16
Basis weight, g./sq. m.	64.3	64.8	66.5	64.6	66.8	61.8	65.1	...
Thickness, 0.001 in.	4.8	4.7	4.77	4.55	4.6	4.27	4.44	...
Apparent specific volume, ml./g.	1.89	1.84	1.82	1.79	1.75	1.75	1.73	(—)8.5
Burst, p.s.i.	9.4	12.9	14.5	15.4	16.1	16.4	18.7	...
Burst factor	10.2	13.9	15.3	16.7	17.2	18.6	20.1	97
Tear, g./sheet	82	105	107	113	124	117	128	...
Tear factor	127	164	161	179	185	190	196	54
Tensile, lb./15 mm.	3.43	4.1	4.53	4.8	4.97	5.07	5.61	...
Breaking length, m.	1610	1900	2020	2200	2240	2470	2590	61
Zero-span tensile, lb.	20.8	....	....	....	....	....	22.8	...
Zero-span breaking length, m.	9730	....	....	....	....	....	10,530	8.2
Zero-span breaking length/breaking length, "% Adhesion"	16.5	(19)	(20)	(23)	(23)	(24)	24.3	47
Adhesion (shear), kg./sq. cm.	1.7	2.2	2.4	2.6	2.7	2.8	2.9	70
Adhesion (split), g./sq. cm.	21	31	32	36	43	43	48	130

a mild process (such as the neutral sulphite cook) possesses a more adhesive surface, as well as a stronger filament, than one prepared, for instance, by a strong soda cook. Similarly, the sulphite process appears to hydrolyze the cellulose in the fibers to some extent and to produce a pulp having better bonding than a pulp made by an alkaline cook, but usually the fiber structure is weakened. Musser and Engel *(17, 18)* also have found that, by hydrolyzing cotton pulp with mineral acids, a faster-beating and in some ways an actually stronger pulp can be obtained, although undoubtedly the fibers themselves are weakened.

It is very desirable to know the reason for one pulp being stronger than another—for example, because the surfaces of the fibers are more adhesive, more of the surfaces of the fibers are in contact, or the fibers are longer or are individually stronger.

Attempts to isolate and measure all the fundamental properties of the pulps, of which the property of adhesion is of paramount importance (indeed, only by virtue of that property do papermaking fibers differ from others), constitute a logical approach toward securing added information to permit a clearer understanding and better control over the qualities of our basic raw material.

APPENDIX

Method for Determining the Bonding Strength of Pulp (Shear Method)

When preparing a set of standard test sheets from pulp, couch a sheet as usual, separate the couch filler blotter, and lay the moist test sheet and couch blotter (with test sheet uppermost) on the table.

Couch another sheet, separate the filler, and lay it on the table as the other; place a stainless-steel drying plate evenly upon it; pick up the plate, sheet, and blotter, and turn them over so that the plate rests on the table. With the side of the hand, rub across the blotter so as to press the sheet in contact with the plate; tear off the dry edges of the blotter; then, with care, peel the blotter off, holding the edge of the test sheet against the edge of the plate with the fingers of the other hand. With some pulps, the sheet will not stick very well to the plate; in that case, after removing the blotter, lift up the sheet by its edges and lay it over the other couched sheet, so that the wire side of the sheet from the plate is in contact with the felt side of the first sheet made. Place two dry blotters in the press and center the moist couch blotter, the duplex sheet, and the plate which is uppermost upon them. Press with the rest of the standard normal test sheets for the standard time and pressure. For the second pressing, use two dry blotters to cover the duplex sheet, instead of the single one used for the normal sheets. Place in the drying rings, and dry and condition as with normal test sheets.

After conditioning and separating from the plate, select an edge of the duplex sheet where the two slightly overlap and separate the sheets at this point. Then work around the entire edge of the duplex sheet with the fingers, pulling the two sheets apart for a distance of about ¼ inch.

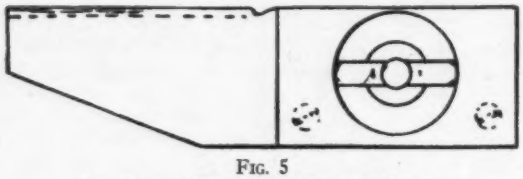

FIG. 5
Plan of Jaw Attachment for Split Adhesion Test

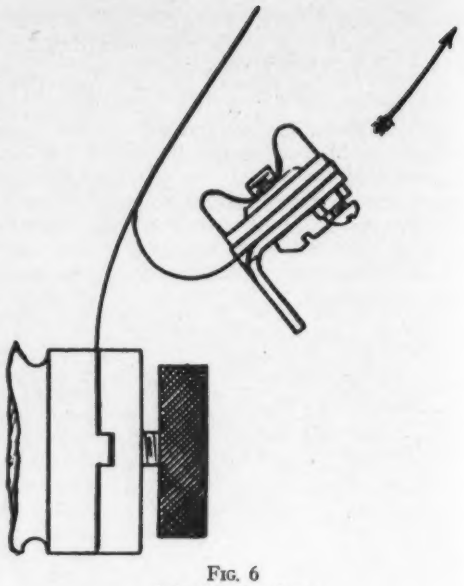

FIG. 6
Split Adhesion Test

Cut a pair of segments from opposite sides of the sheets, leaving a parallel strip 6 cm. wide across the center of the sheets if specimens are required for the split adhesion test. Take each segment and separate the two sheets along the straight edge; cut each into a number of short parallel strips at right angles to the straight edge; then cut each into a number of short parallel strips at right angles to the straight edge exactly 15 mm. wide and over 1.5 inches long.

Clamp the 2-mm. wide template across the center of each strip over 1.5 inches long and continue the separation of the sheets up to the edges of the template. This procedure will give about 12 specimens in the form of an X. As the joint is easily broken by twisting, the specimens should be handled with care.

PROCEDURE

Set the jaws of the tensile tester one inch apart, carefully insert the opposite tabs of a specimen, and gently tighten the clamping screws of the jaws (*see* Fig. 3). (The tensile pull will be low; there is no need, therefore, to use force on the screws, which may twist the jaws of the tensile tester sufficiently to rupture or to weaken the joint in the specimen.) Apply the load at such a rate that fracture will occur between 7 and 15 seconds. Note the reading to two significant figures. Make ten tests and discard any result which is less than three quarters of the average of the two or three highest readings, as this specimen has probably been damaged. Average the remaining readings.

Method for Determining the Bonding Strength of Pulp (Split Method)

Use a duplex sheet, prepared as described in the previous method, with the edges loosened. Put the sheet on a hardwood block and place the template (*see* Fig. 2) on the sheet so that the edge of its triangular extension coincides with the separated edge of the sheet, with the opposite edge of the template lying along a diameter. With a sharp knife, cut along the

edges of the template to obtain a specimen. Place the template on the opposite side of the sheet in the same way and cut out another test specimen. The two segments which remain are suitable for the adhesion-shear test described.

With the template or a rule, mark a line on the triangular ends of the specimens, showing the boundary of the portion to be tested. This is a little more than ¼ inch from the edge of the sheet. Split the specimen to this line and fold the tab along this line on the glazed side of the sheet, so that it extends beyond the rest of the sheet.

Calibration of Apparatus

Check the area of the specimen which is to be tested. Weigh the extension jaw (*see* Fig. 5 and 6) and calculate or determine its center of gravity, which should be marked on a little piece of gummed paper suitably attached to the under side of the jaw. After leveling and checking the zero reading of the Elmendorf tear tester, clamp the extension jaw in position in the movable jaw of the tear tester so that its edge is parallel to and 2-3 mm. away from the edge of the fixed jaw · take several readings. Recalibrate the tester (which, it is assumed, has been previously calibrated by the standard method) by raising the sector so that the pointer corresponds to readings of 10, 20, 30, etc. and, holding the sector in that position, accurately measure the height to which the center of gravity of the extension jaw has been raised from its initial position. Knowing the weight of the extension jaw, the added work done in raising it by a measured distance is the product of the two readings in gram-centimeters.

Example: Reading of tester by operating with extension jaw in position, 6.55 divisions; weight of the extension jaw, 48.2 grams; initial height of the center of gravity of the extension jaw above the surface of the fixed jaw, 2.5 mm. The Thwing-Elmendorf tester is normally calibrated so that each division equals 16 × 4.3 × 2 = 137.5 g.-cm. Calibration proceeds as shown in Table VIII.

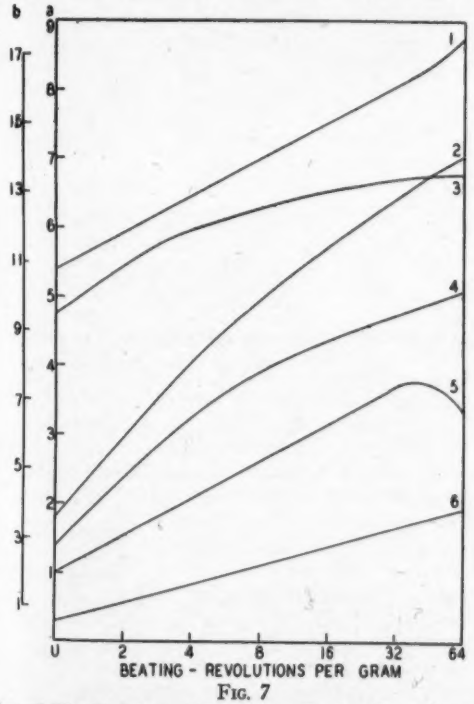

FIG. 7

Effect of Wet Pressing and Beating on Bonding Strength. 1. Apparent Density (a/10). 2. Breaking Length (a × 1000), m. 3. Zero-Span Breaking Length (b × 1000), m. 4. "% Adhesion" (a × 10). 5. Adhesion Split (b × 10), g.-cm./sq. cm. 6. Adhesion Shear (a × 10), kg./sq. cm.

TABLE VIII.—CALIBRATION OF TEAR TESTER FOR ADHESION TEST

Reading Divisions	Normal Work by Tester g.-cm.	Net Height Jaw Lifted cm.	Added Work Done g.-cm.	Net Work (Adhesion) g.-cm.
6.55	903	18.70	903	0
10	1375	18.65	900	475
50	6880	17.50	845	6035
100	13,750	13.95	673	13,077

In practice, the reading at each interval of 10 was taken and an almost perfectly straight line resulted, having the equation:

$$W = 140\,A\,(R - 6.55) \text{ g.-cm.}$$

where R = the pointer reading, W = the work done, and A = the area of the specimen. For a 40-sq. cm. specimen. Work in g.-cm./sq. cm. = 3.5 $(R - 6.55)$ = 3.5 R − 23.3

Procedure

Clamp the separated tabs of the test specimen in the fixed jaw of the tester and the extension jaw, seeing that the edges of the side of the specimen are vertical and that the specimen is positioned symmetrically. Manipulate the instrument as for the tearing test and note the pointer reading for at least two, or preferably four, specimens, although the readings for two specimens have usually agreed.

Calculate the work done to separate the plies in terms of gram-centimeters of work per square centimeter of duplex specimen.

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Protective Coatings for Paper

A new method for treating paper containers for packaging a variety of products, is being introduced by Protective Coatings, Inc., Detroit, Michigan.

It is a hot method process by which the paper is completely impregnated, forming a barrier to the passage of most materials, excepting strong acids and potent solvents. The concern states that the ordinary Sealright cartons after processing is adapted to the shipment of liquids, vinegars, oils and highly hygroscopic materials.

The concern has also developed other coatings, such as "Acquanil," a non-oxidizing water resisting treatment for metals, woods, concrete, paper, canvas and other fabrics; "Synthetex, Type 5," a high moisture-resistant coating for paper, and a rust inhibitor for metal; Coating "30" has been developed to protect blueprints, drawings, maps, charts, tags and other paper articles that are subject to much handling.

TAPPI Container and Package Exhibit

The important work that is being done in the development of containers, packages, and paper specialties will be amply demonstrated at the exhibit of the Technical Association of the Pulp and Paper Industry, Hotel Commodore, New York City, February 15-18, 1943. The exhibit is being held in connection with the TAPPI Annual Meeting.

Several thousand people will have the opportunity to see the proof of the many ways in which paper is being utilized for the armed forces, industries, and civilians.

Many new war uses of paper and paperboard will be displayed, and its value as a substitute for critical metals will be emphasized.

Some of the items of paper and paperboard to be shown include: maps, weather and waterproof drums and boxes, dehydrated food packages, tobacco containers, ammunition containers, greaseproof food containers and wrappers, antiaircraft shell containers, army ration packages, airplane parts, toothpaste tubes, containers for ink, oil, and chemicals, etc.

Among the exhibitors, who include manufacturers, converters, and consumers, are the following companies:

U. S. Quartermaster Corps, C. E. Twombly Company, National Association Service, Interstate Folding Box Company, U. S. Dept. of Commerce, Elmer Candy Company, Matthias Paper Corporation, Gaylord Container Corporation, Robert Gair Company, Beech-Nut Packing Company, Mono Service Company, Southern Pulpwood Conservation Association, Paper Shipping Sack Association, Brown and Williamson Tobacco Company, Hinde & Dauch Paper Company, Carpenter Container Corporation, Thomas M. Royal and Company, Old Dominion Box Company, Menasha Products Company, Myles Salt Company, Reynolds Metals Company, F. A. Read, Inc., Michigan Research Laboratories, General Cellulose Company, United Drug Company, F. N. Burt Company, Sonoco Products Company, Keystone Roofing Manufacturing Company, Stecher-Traung Lithograph Corporation, Quickut Home Papers, Mutual Paper Company, Wrenn Paper Company, American Can Company, Kimberly-Clark Corporation, Oxford Filing Supply Company, Package and Container Corporation, Food Industries Magazine, Modern Packaging, Johnson & Johnson, Socony Vacuum Oil Company, Ply-Fibre Corporation, National Starch Products, Inc., Sealright Corporation, E. R. Squibb & Sons, National Biscuit Company, Westinghouse Electric and Manufacturing Company, General Mills, Inc., and F. A. Read, Inc.

Companies interested in having their products displayed in the TAPPI Exhibit should write or telephone to R. G. Macdonald of the Association at 122 East 42nd street, New York City, at once.

Swedish Processes to be Studied

Dr. Edwin C. Jahn, Department of Pulp and Paper Manufacture, New York State College of Forestry, Syracuse University, has been granted leave to study the war uses of pulp and wood in Sweden, according to an announcement by Professor Clarence E. Libby, head of the Pulp and Paper division of the College.

"In Sweden many new developments have recently been made in pulping processes and in the utilization of wood. Recently the manufacture of synthetic rubber from wood was reported," says Professor Libby.

He states that three organizations are interested in his study, namely, the United States Department of Agriculture, the New York State College of Forestry and the Technical Association of the Pulp and Paper Industry. Dr. Jahn has a temporary appointment to the Research Division of the Department of Agriculture for the period of his leave from the College of Forestry.

Dr. Sydney Coppick has been appointed to Dr. Jahn's position. Dr. Koppick is a graduate of McGill University in chemical engineering. Later he received the degree of Master of Science from the University of Idaho and Doctor of Philosophy from the New York State College of Forestry. He has had industrial experience in the pulp, fiber board and rayon industries and comes to the college from the University of Texas, where he was doing research in cotton chemistry.

Arthur D. Little, Inc. Elects Officers

Chemists, physicists and engineers on the research staff of Arthur D. Little, Inc., have been engaged principally on war work of unusual interest, but of an especially confidential nature, according to the report of E. P. Stevenson, President of the Cambridge industrial research organization, read at its annual meeting on January 27th. Mr. Stevenson has devoted most of his own time and effort to the work of the Office of Scientific Research and Development, in charge of one of the branches of the National Defense Research Committee.

Roger C. Griffin of Needham, Mass., son of Roger B. Griffin, who with Arthur D. Little founded the organization in 1886, was elected vice president, and Henry G. Powning of Manchester, Mass., succeeds him as treasurer. Frank N. Houghton of Elmwood, Mass., was elected secretary, and Russell H. Stephens of Newton, comptroller. Mr. Stevenson as president, Raymond Stevens and Thorne L. Wheeler, vice presidents, were reelected. Directors for the coming year are: Earl P. Stevenson, Henry G. Powning, Roger C. Griffin, Horace S. Ford, W. Cameron Forbes, Randolph C. Grew, Royal Little, Charles E. Spencer, Jr., and Alexander Whiteside.

To Hear Talk on Modern Materials

R. T. Barnes, Jr., will speak before the meeting of the Delaware Valley Section of the Technical Association of the Pulp and Paper Industry on February 5, 1943, at the Engineers Club, Philadelphia, Pa. The talk will be on "The Role of Modern Materials in Papermaking Machinery."

Mr. Barnes, a member of the Technical Service Staff of The International Nickel Company, Inc., will review both the economic and engineering importance of corrosion-resisting metals and alloys in papermaking machinery and he will emphasize the economic advantages to be gained through the use of materials which give longer service life, require minimum maintenance, and make use of modern process methods.

The talk will be illustrated with slides showing data and equipment.

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There can be no paper quality without wire cloth quality. The paper-forming process depends for its success upon the quality of the body mesh. Contributing factors are weave pattern, selvedge, seam, and the metal itself. It is on the bed of warp and shute knuckles pictured above that the slurry of interwoven fibres comes finally to rest.

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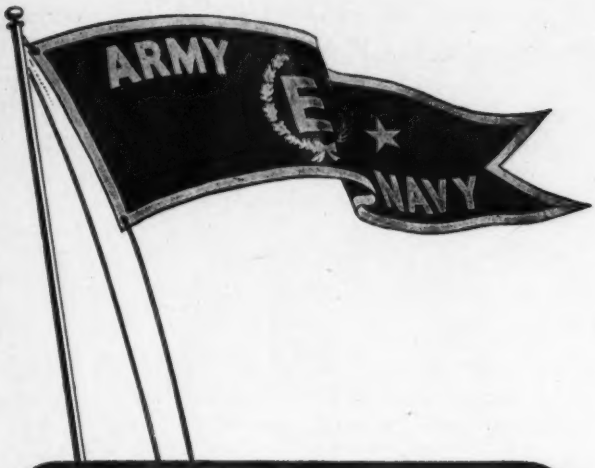

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1843 STANLEY 1943

TRADE MARK

IMPORTS OF PAPER

NEW YORK IMPORTS

WEEK ENDING JANUARY 30, 1943

SUMMARY

Newsprint ..... 2,627 rolls

NEWSPRINT

World Telegram, ——, ——, 398 rolls.
Evening Bulletin, ——, ——, 1216 rolls.
N. Y. Sun, ——, ——, 596 rolls.
——, ——, ——, 417 rolls.

BONES

——, ——, ——, 4690 bags.

GLUE STOCK

——, ——, ——, 98 bls.
——, ——, ——, 37 bls.

PHILADELPHIA IMPORTS

——, ——, ——, 2210 tons china clay.

Boston News Items

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., January 25, 1943—The demand for wrapping paper is above normal, according to the trade, particularly for convering purposes. This condition has developed because tin is needed so much by the Government. Many papers are treated so as to render them moisture proof for packaging purposes. Papers used in bags and other containers of various kinds are also in demand.

C. A. Esty, president of Carter Rice & Co., Corporation, has returned from Chicago, where he was a representative with a group of paper merchants from all over the country at an OPA meeting.

Arthur Schroeder, president, Pejepscot Paper Company, was a recent visitor to the Boston office of the company.

To be Chief of Kraft Board Unit

Norman T. Beardsley has recently been named chief of the Kraft Board Unit of the paper board section of the War Production Board. Mr. Beardsley is manager of the Board and Pulp Division of Union Bag and Paper Corporation.

He is eastern vice-president of the Salesmen's Association of the Paper Industry, and a charter member of the Paper Club of New York.

Dr. Illick to be Acting Dean

Dr. Joseph S. Illick has been appointed acting dean of the New York State College of Forestry at Syracuse University by the executive committee of the board of trustees. This announcement was made by Chancellor William P. Tolley of Syracuse University, chairman of the executive committee of the college trustees. The appointment was made because of the illness of Dean Samuel N. Spring, who underwent a major operation at the Good Shepherd Hospital and will be unable to return to the college for some time. Assistant Dean Clyde Leavitt will continue with his present responsibilities.

Dr. Illick is head of the Department of Forest Management at the New York State College of Forestry. He holds degrees from Lafayette College, Biltmore Forest School and Juniata College.

He taught at Pennsylvania State Forest School, the Biltmore Forest School, studied at the University of Munich, was subsequently director of the Pennsylvania State Forest School and later chief of silviculture, Pennsylvania Department of Forests and Waters. He advanced to chief of research and then to state forester of Pennsylvania. He joined the New York State College of Forestry as special lecturer in silviculture, 1931, and the same year became head of the Department of Forest Management.

He is the author of 12 books and a large number of formal bulletins, short articles and many papers dealing with the field of forestry and conservation. Dr. Illick is a member of the American Association for the Advancement of Science, the Society of American Foresters, the Pennsylvania Engineering Society and the American Society of Public Administration.

Increases Speed of Paper Making

Speed of paper manufacture is increased as much as 10 per cent by a new use of a Du Pont chemical which greatly retards the formation of slime in mill machinery, it was announced today. Moreover, a few ounces added to ground wood pulp stored for making newsprint prevents deterioration due to mold and bacteria for over a year, although thirty days is usually sufficient during warm weather to cause spoilage.

With this chemical, called "Lignasan," mills have been known to go six weeks without halting for a clean-up. Slime is created, a Du Pont chemist pointed out, by microscopic organisms entering mills in the vast volume of water used in paper manufacture. This mold-destroying chemical has been used for several years to prevent the objectionable "blue stain" in freshly sawed lumber, but it has come into use only recently for preventing slime developed in pulp and paper mills.

Significance of the new development lies chiefly in the preservation of pulp and the releasing of vital cellulose for gunpowder. The announcement made clear that while more efficient slime control saves considerable non-productive labor, it probably will not result in more newsprint being available, since pulp supplies are strictly allocated.

Linseed Straw for Paper Making

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., January 27, 1943—Use of linseed straw for paper making has been studied in Indiana and it has been found that fiber extracted after the seed has been threshed is suitable for the manufacture of finer grades of paper, according to trade reports reaching the Department of Commerce. Methods of bleaching and softening the material are being studied.

F. A. Read Inc. Opens Office

In reporting the opening of an office at 55 W. 42nd street, New York, by F. A. Read, Inc., of Albion, N. Y., the name of the company was incorrectly spelled. The new office is under the direction of Harold M. Fox who is well known in the paper bag industry. F. A. Read, Inc., manufacture Fibrok custom-made and semi hand-made paper bags, covers, waterproof liners and fruit growers supplies.

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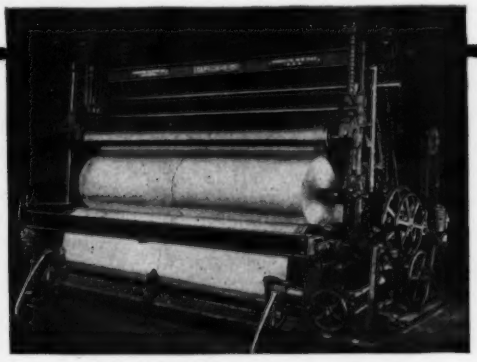

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Paper Roll Density

CAMACHINE 15, a new development, gives you precisely the paper roll density needed for good shipping and good control of the web in unwinding. Proof of this is readily found in the service records of this machine; for example, one mill's first installation has resulted in four re-orders. In addition to careful counterweighting, Camachine 15 has large diameter rewind drums and riding roller, of a type heretofore available only on much heavier equipment. Write for details.

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ARMY E NAVY

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New York Paper and Pulp Market Review

All Major Grades of Paper in Active Demand—Bleached Chemical Pulp Scarce—Mill Buying of New Rags Fair—Demand For Old Waste Paper Slow—Trading in Scrap Bagging Reported Light.

Office of the PAPER TRADE JOURNAL.
Wednesday, February 3, 1943.

Demand for major grades of paper continues active, according to most of the reports received from many manufacturers' representatives, jobbers, and general paper merchants during the current week.

The index of general business activity for the week ended January 23 declined to 133.3, from 138.8 for the preceding week, compared with 139.7 for the corresponding week last year. Paper board production was fractionally higher at 142.6, compared with 142.1 for the previous week, and with 171.8 for the week ended January 24, 1942.

Paper production for the week ended January 23 was estimated at 88.0%, compared with 105.0% for 1942, with 87.9% for 1941, with 91.7% for 1940, and with 81.4% for the corresponding week for 1939.

Paper board production for the week ended January 23 was 88.0%, compared with 104.0% for 1942, with 78.0% for 1941, with 75.0% for 1940, and with 68.0% for the corresponding week for 1939.

In his report sent to Congress, Leon Henderson, retiring Administrator of the Office of Price Administration, declared that the "honeymoon" period of business expansion which had lifted profits above normal peace-time levels had come to an end, and that ahead lie increasing difficulties." Costs are increasing," he warned, "with consequent growing pressure on OPA price ceilings. Difficult as has been the problems of economic stabilization during the first year of the war, they will be dwarfed by those of the second year. In the year ahead, the output of war goods will be doubled and the supplies available for civilian consumption reduced. In the year ahead, peak mobilization for war will be attained, with inevitable strain and pressure. Furthermore, although the elements of the stabilization program are all in place, their full deveopment is yet to be achieved. There must be a still more vigorous tax program, supplemented by an unprecedented expansion of savings. There must be a firmness and toughness in the control of prices and incomes. There must be a broadening of the rationing program until all essential goods which are in short supply are equitably distributed. These are requirements which impose severe demands upon all. But they must be met and they can be met. Inflation can be held in check if we, as a united country, adhere to the line that has now been staked out."

Leon Henderson's final report indicated the following percentage of return on net sales: all corporations, 1939, 8.1%; 1940, 10.3%; 1941, 13.5%. Durabe goods, 1939, 10.1%, 1940, 14.0%; 1941, 17.6%. Non-durable goods, 1939, 7.8%; 1940, 9.0%; 1941, 11.6%. Paper and paper products, 1939, 5.4%; 1940, 12.0%; 1941, 16.5%.

Wood Pulp

Demand continues active for all prime grades of chemical wood pulp. Bleached sulphite and sulphate pulps are scarce and strong unbleached sulphite is also more difficult to obtain. No important change in the pulp market has been reported at this date.

Rags

Cotton cuttings are reported in fair demand at this date. Prices are firm and reports from this market reflect rising costs and increasing difficulty in obtaining labor for sorting and packing.

Old Rope and Bagging

Demand for Manila rope continues steady. No important change in this market has been reported during the current week.

Trading in scrap bagging is reported light, attributed in great part to the very limited supply situation. As paper has to an increasing extent replaced burlap, the general demand for new bagging is declining, hence the trend in the supply of scrap bagging continues downward.

Old Waste Paper

Mill buying of the higher grades of waste paper is reported steady at this date. Activity in the lower grades is only fair. No important change in prices has been reported at this date.

Twine

Demand continues seasonally active for all standard grades of hard and soft fiber twines, with military demands heavy. One manufacturer issued on January 26 notice that it was discontinuing, until further notice, all package bales, and various weights of balls, skeins and sizes of bales in soft fiber twines, including India, wrapping and sewing grades, clothes lines, tarred specialties and soft fiber rope.

Salesmen Name Guest Speaker

The Salesmen's Association of the Paper Industry will hold its 24th annual luncheon in the grand ballroom of the Waldorf-Astoria Hotel, New York, February 16, at 12:30 P.M.

The guest speaker will be Frank Gervasi, associate editor of *Collier's* Magazine and the author of "The War Has Seven Faces."

Mr. Gervals is well known as a foreign correspondent and reporter who has visited all the fighting fronts. He is referred to as a speaker who reports facts about the war uncolored by propaganda. He has crossed the Atlantic in a bomber, sailed to South Africa in a convoy, covered the war fronts in mechanized army transportation units and was in Libya at the fall of Tobruk.

Reservations for the luncheon should be made early and sent to E. O. Merchant, secretary, 122 East 42nd street, New York.

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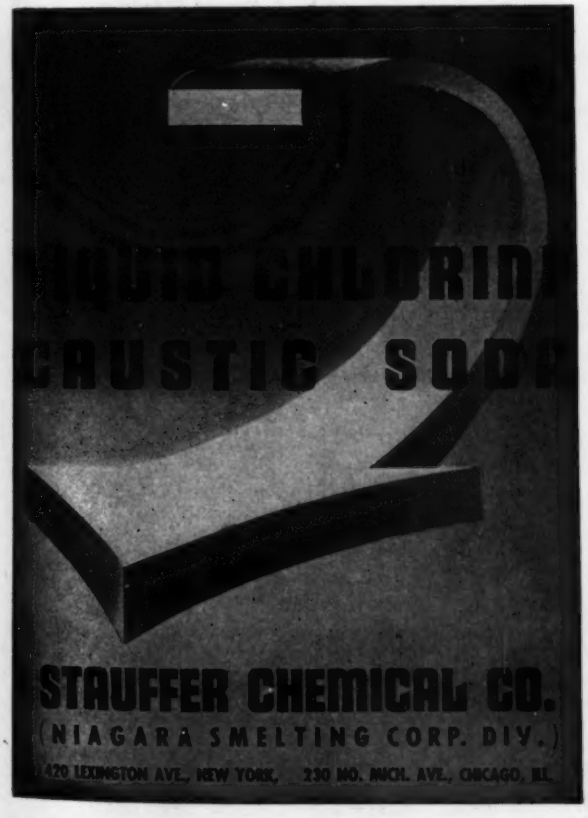
There is no priority on the manufacturing precision which Heppenstall has developed after more than 50 years of fine steel forging experience. It pays to specify *Heppenstall* when your knives need replacement. Current ratings: E.I.S. alloy steel A-1-J or better; special carbon steel A-10 or better. Address Heppenstall Company, Pittsburgh, Pa.



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KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

MILLS:
Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Cass, West Virginia
Charleston, South Carolina

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL.
Wednesday, February 3, 1943.

BLANC FIXE—Quotations on blanc fixe are firm and continue unchanged at prevailing market levels. The pulp is currently quoted at $40 per ton in barrels, at works; the powder is offered at $60 per ton, f.o.b. works. Demand reported fair for the week.

BLEACHING POWDER—Prices on bleaching powder are firm. Current demand reported active. Bleaching powder is currently quoted at $2.50 per 100 pounds, in fiber drums, at works.

CASEIN—Quotations on casein are unchanged for the week. Standard domestic casein, 20-30 mesh, is quoted at 19 cents per pound; 80-100 mesh at 19½ cents per pound; all prices in bags, car lots. Argentine casein, 20-30 mesh, is currently quoted at 9 cents per pound, c.i.f. No quotations on French casein.

CAUSTIC SODA—Prices on caustic soda are reported unchanged. Demand for the current week is reported more active. Solid caustic soda is currently quoted at $2.30 per 100 pounds, flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged. Demand reported fair for the current week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton at mine. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine unchanged. Government demand for war use continues heavy. Prices firm. Chlorine is currently quoted at from $1.75 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—Quotations on some grades of rosins are lower for the current week. "G" gum rosin is currently quoted at $3.40 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $3.38 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is quoted at $3.62 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake are firm. Demand reported moderate for the current week. Domestic salt cake is currently quoted at $15 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point. Quotations on imported salt cake are nominal at $16 per ton.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Demand active. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH — Prices on corn starch continue unchanged for the current week. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA — Quotations on sulplate of alumina are firm. Demand reported light. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at from $1.75 to $1.83 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $16 to $21 per ton, at mills. No quotations on imported talc.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	$5.00	@	—
No. 1 Wrapping	4.75	"	—
Standard Wrapping	4.50	"	—
Standard Bag	4.125	"	—
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.05	"	—
White No. 1½	1.00	"	—
White No. 2	1.00	"	—
Anti-Tarnish M. G.	.95	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case			
Unbleached, Jr.	2.35	"	—
Bleached, Jr.	2.65	"	—
Manila—per cwt.—C. l. f. s			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	5.30	"	5.75
No. 2 Manila Wrapping, 35 lb.	5.25	"	5.50
Boards, per ton—			
News	*48.00	@	—
Chip	*45.00	"	—
Sgl. Mls. Ll. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*60.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper

Delivered in Zone 1.

No. 1 Glossy Coated	$13.65	@	$15.30
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	13.20
No. 4 Glossy Coated	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.75
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. & S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. & S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C.	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight to Destination.

Bl. Softwood Sulphite	$76.00		
Unbl. Softwood Sulphite	64.00	@	66.00
Bl. Hardwood Sulphite	73.50		
Unbl. Hardwood Sulphite	63.50		
Bl. Mitscherlich	81.00		
Unbl. Mitscherlich	72.00		
N. Bleached Sulphate	86.00		
S. Bleached Sulphate	79.00		
N. Semi-Bleached Sulphate	63.00		
S. Semi-Bleached Sulphate	75.00		
N. Unbl. Sulphate	73.00		
S. Unbl. Sulphate	63.50		
Bl. Soda	66.00		
Unbl. Soda	62.00		
Groundwood	46.00		

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum price

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	6.50	@	6.75
Silesias No. 1	4.50	"	4.75
New Unbleached	6.50	"	6.75
Blue Overall	5.00	"	5.25
Fancy	3.50	"	3.75
Washables	2.75	"	3.00
Mixed Khaki Cuttings	2.75	"	3.00
O. D. Khaki Cuttings	3.25	"	3.50

More than just a TRADE MARK

EXCELSIOR KNOX Woolen Co. Camden, Me. FELTS & JACKETS

BUT also a guarantee by men who for 78 years have prided themselves in making finer felts. TO YOU —this is the mark of dependability, longer felt life and greater saving.

KNOX WOOLEN CO.
CAMDEN, MAINE.

"Put 'em on, Buddy! We need your eyes"

"I'm giving everything I've got, to preserve the kind of a world you want to live in. I'm not kicking either, but I'm expecting you to do your part, too. I depend on your help—in buying War Bonds, in saving your tires, in searching the house for scrap metal. More than that, I'm counting on you for a full week's work—every week."

Industrial eye injuries mean priceless days lost. Foggy vision means costly mistakes and rejections. Whatever your job, your work is no better than your eyes.

For every job, for every requirement you may impose on your eyes, there are goggles and glasses to protect eyes and bring vision to top performance. Shock-proof lenses. Heavy-duty frames for every industrial use. Lenses to correct almost any visual defect. Graceful rimless eyewear for those who want to look well while they see well.

Bausch & Lomb is manufacturer of goggles, lenses, eyewear and eye examination instruments. Less spectacular, perhaps, these contributions are as important as the special Bausch & Lomb instruments of war—range finders, binoculars, anti-aircraft height finders, aviators' goggles, aerial mapping equipment, and many others going every day to the forces of the United Nations.

Your eyes are important to you—important to the nation. There are men in your community qualified to examine your eyes skillfully, to fit the right glasses. They are ready to put your eyes in fighting trim.

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The capacity of our plant is being used for defense production, twenty-four hours a day, seven days a week.

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Hermann employees are proud possessors of the 10% minute man flag, for over 10% of their wages being deducted for war bonds.

THE HERMANN MANUFACTURING COMPANY

CLAFLIN REFINERS — PULP TESTING APPARATUS

LANCASTER, OHIO

Old Rags

White, No. 1—			
Repacked	*1.80	"	—
Miscellaneous	*1.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

*OPA Maximum Prices.

Foreign Rags

All prices nominal
New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.00	@	4.25
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	4.75
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	4.25	"	4.75
Sisal Strings	*3.00	"	4.00
Mixed Strings	1.10	"	1.20

*OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)
OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.57½	"	—
Mixed Books	.85	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old Kraft Corrugated Containers	1.50	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	.85	"	—

Twines

(F. o. b. Mill)
(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—
(Hard Fiber)			
Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1	.07½	@	.07½
New White No. 2	.04½	"	.05
Light Silesias	.04½	"	.04¾
Silesias, No. 1	.04	"	.04¼
Black Silesias, soft	.03¾	"	.04
New Unbleached	.07¼	"	.07½
Washable Prints	.03¾	"	.03½
Washable No. 1	.02	"	.02¼
Blue Overall	.04½	"	.05½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales	.03¼	"	.03½
New Black Soft	.02¾	"	.03
New Dark Seconds	1.75	"	2.00
Khaki Cuttings—			
No. 1 O. D.	.03	"	.03¼
No. 2 Mixed	.02¼	"	.02½
Corduroy	.01¾	"	.02¼
New Canvas	.04¾	"	.05¼
New Black Mixed	—	"	.02½

Domestic Rags (Old)

White No. 1—Repacked	3.80	"	—
White No. 2—Repacked	2.90	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
Sisal Rope	3.75	"	—
Mixed Rope	.75	"	1.00
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)
OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Jute Corrugated Cuttings	.90	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)
OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old Corrugated Containers	1.00	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	3.75	@	—
Sisal Rope No. 1	4.00	"	—
Sisal Rope No. 2	3.00	"	—
Mixed Rope	1.35	"	1.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.75	"	5.25
Jute Carpet Threads	3.25	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.25	"	3.75
Wool Tares—			
Foreign	(nominal)		
Domestic	3.75	"	4.00
Aust. Wool Pouches	5.25	"	—
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.60
Paper Mill Bagging	2.75	"	3.00
No. 2 Bagging	1.35	"	—

*OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¼	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06½
Underwear Cutters, Bleached	.06¼	"	.06½
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06½
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05¼	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	.03
Khaki Cuttings	.03¼	"	.03¾
O. D. Khaki	.03¼	"	.03¾
Corduroy	.03¾	"	.03½
New Canvas	.06¼	"	.06¾
B. V. D. Cuttings	.06¼	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.30
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

*OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)
OPA Maximum Prices.

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.50	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—